6.7 Distance control (optional)

The Distance Control regulating unit for the sprayer boom automatically holds the sprayer boom parallel at the desired distance from the target surface.

Two ultrasound sensors (Fig. 91/1) detect the distance to the ground or the crop. If the height deviates from the desired measurement on one side, the distance control regulates the tilt adjustment in order to adjust the height. If the terrain rises on both sides, the height adjustment raises the entire boom.

Switching off the sprayer boom on a headland will automatically raise the sprayer boom by approx. 50 cm. When switched back on again, the sprayer boom is lowered back to the calibrated height.

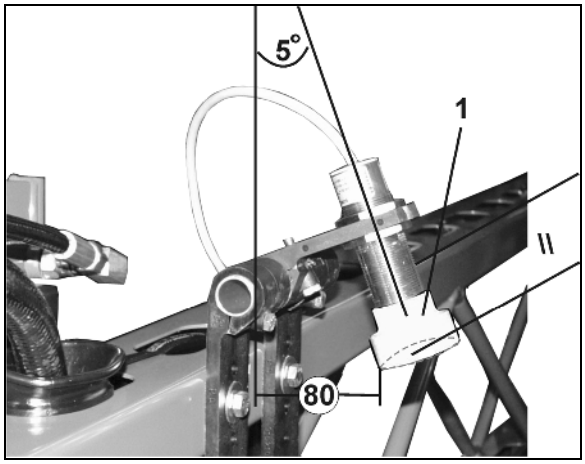


Fig. 91

See **AMATRON+ operating manual.**

- Setting the ultrasound sensors:

→ see Fig. 91

6.8 Spray lines and nozzles

The sprayer booms can be fitted with various spray lines. In turn, the spray lines can be fitted with single nozzles or multi nozzles, depending on the predominant conditions of use.

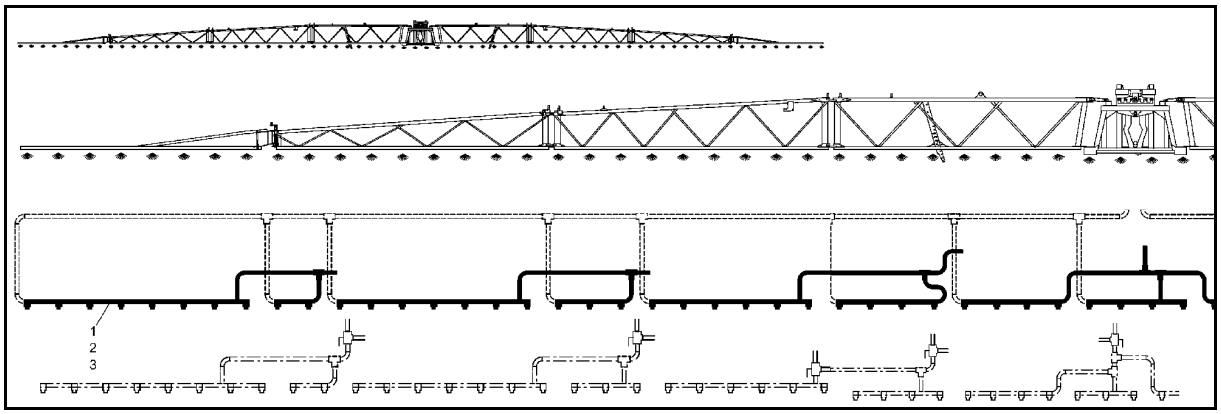


Fig. 92

6.8.1 Technical data

Ensure that the residue in the spray line is still being sprayed at an undiluted concentration. Always spray this residue on an untreated area. The residue contained in the spray line is dependent on the sprayer boom working width.

Formula for calculating the required distance in [m] for spraying out the undiluted residue in the spray line:

$$\text{Required distance [m]} = \frac{\text{Undiluted residue [l] x 10,000 [m}^2\text{/ha]}}{\text{Spray rate [l/ha] x working width [m]}}$$

Spray line **Super-S** sprayer boom with single nozzles or multi-nozzles

Working width	**[m]**	**18**	**20**	**21**	**21/15**	**24**	**27**		**28**	
Number of part width sections		5		7			9		7	9
Number of nozzles per part width section		6-8-8-8-6	8-8-8-8-8	9-8-8-8-9	6-6-6-6-6-6	6-6-8-8-8-6	9-6-8-8-8-6-9	6-6-6-6-6-6-6	8-8-8-8-8-8-8	7-6-6-6-6-6-6-7
Residue	[l]									
• dilutable		4.5		5.0			5.5		5.0	5.5
• not dilutable		8.0	8.5	9.0	10.0	11.5	12.5	17.5	13.0	17.5
• total		12.5	13.0	13.5	15.0	16.5	17.5	23.0	18.0	23.0
Residue in pressure circulating system (DUS)										
• dilutable		13.5	14.0		16.0	17.5	18.5	24.0	19.0	24.0
• not dilutable		1.0		1.5				2.0		
• total		14.5	15.5	16.0	17.5	19.0	20.5	26.0	21.0	26.0
Weight	[kg]	13.0	15.0		20.0	22.0	27.0	29.0	28.0	30.0

Working width	**[m]**	**24**	**27**	**27/15**	**28**	**28/15**	**30/15**	**32**	**33**		**36**		**39**		**40**
Number of part width sections		7		9	7	9				11	7	9	9	13	9
Number of nozzles per part width section		6-6-8 8 8-6-6	8-7-8- 8- 8-7-8	6-6-6-6 6- 6-6-6-6	9-7-8- 8- 8-7-9	7-6-6-6 6- 6-6-6-7	8-7-6-6 6- 6-6-7-8	8-6-7-7 8- 7-7-6-8	7-8-7-7 8- 7-7-8-7	6-6-6-6-6- 6 6-6-6-6-6	10-10-10- 12- 10-10-10	9-9-7-7- 8- 7-7-9-9	7-9-9-9- 10- 9-9-9-7	6-6-6-6-6-6- 6- 6-6-6-6-6-6	8-9-9-9- 10- 9-9-9-8
Residue	**[l]**														
• dilutable		5.0		5.5	5.0	5.5				6.0	5.0	5.5	5.5	6.5	5.5
• not dilutable		11.5	12.5	17.5	13.0	17.5	18.0	18.5	19.0	23.0	16.0	19.5	20.5	28.0	21.0
• total		16.5	17.5	23.0	18.0	23.0	23.5	24.0	24.5	29.0	21.0	25.0	26.0	34.5	26.5
Residue in pressure circulating system (DUS)															
• dilutable		17.5	18.5	24.0	19.0	24.0		24.0	25.0	29.5	21.5	25.5	26.5	35.0	27.0
• not dilutable		1.5	2.0				2.5			2.5	3.0				
• total		19.0	20.5	26.0	21.0	26.0	26.5	27.0	27.5	32.0	24.5	28.5	29.5	38.0	30.0
Weight	**[kg]**	22.0	27.0	29.0	28.0	30.0	32.0	34.0	35.0	37.0	36.0	38.0	41.0	46.0	42.0

6.8.2 Single nozzles

Fig. 93/...

(1) Nozzle body with bayonet connection (standard).

(2) Diaphragm. If the pressure in the spray line falls below approx. 0.5 bar, the spring element (3) presses the diaphragm onto the diaphragm seat (4) in the nozzle body. This ensures that when the sprayer boom is switched off, the nozzles are deactivated without subsequent dripping.

(3) Spring element.

(4) Diaphragm seat.

(5) Slider - holds the entire diaphragm valve in the nozzle body.

(6) Nozzle filter; **fitted as standard on machines with 50 mesh/inch**, is inserted from below into the nozzle body. Refer to the "Nozzle filter" section.

(7) Rubber seal.

(8) Nozzle.

(9) Bayonet connection.

(10) Coloured bayonet cap.

(11) Spring element housing.

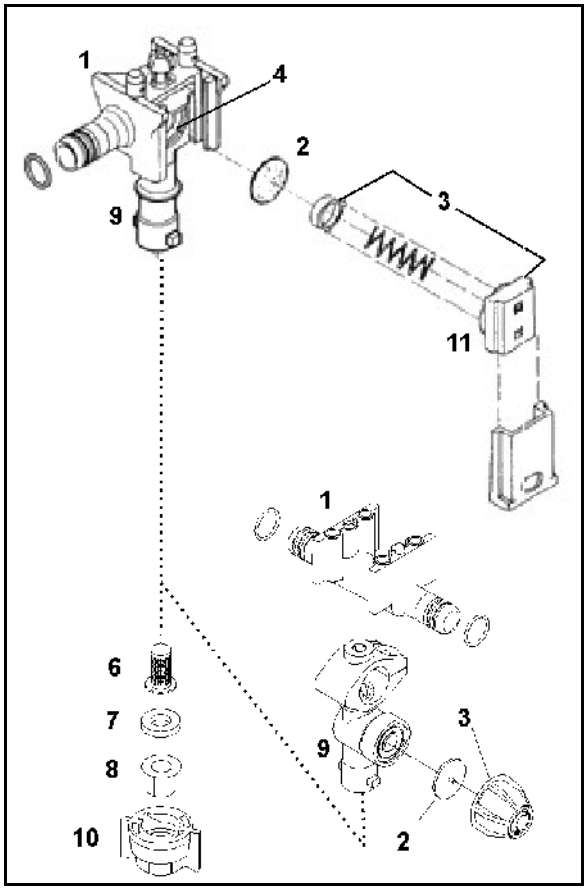


Fig. 93

6.8.3 Multi nozzles (optional)

When using multiple nozzle types, it is beneficial to use multi nozzles (Fig. 94). In each case, the nozzle pointing upwards is the one that is supplied.

Turning the multi nozzles head (Fig. 94/1) anticlockwise brings a different nozzle into play.

The multi nozzles head is switched off in the intermediate positions. This provides the possibility of reducing the working width of the boom.

Rinse the spray lines before twisting the multi nozzles head onto another nozzle type.

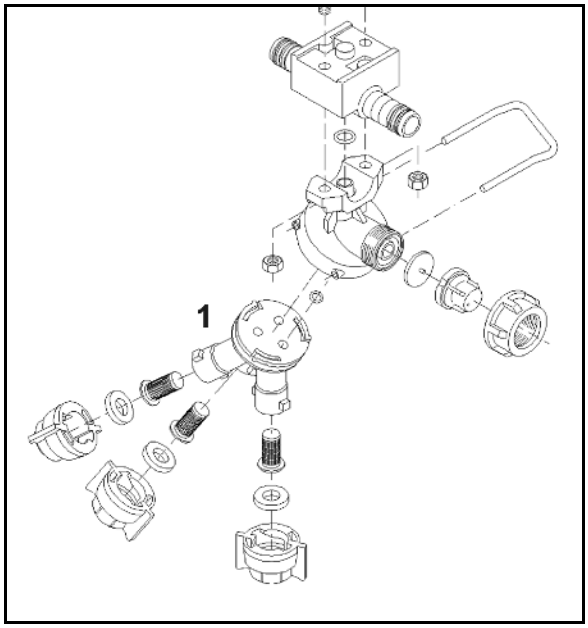


Fig. 94

(1) Nozzle carrier.

(2) Triple nozzle head.

(3) Diaphragm. If the pressure in the nozzle line falls below approx. 0.5 bar, the spring element (4) presses the diaphragm onto the diaphragm seat (5) in the three-way nozzle carrier. This ensures that when the sprayer boom is switched off, the nozzles are deactivated without subsequent dripping.

(4) Spring element.

(5) Diaphragm seat.

(6) Sleeve nut - holds the entire diaphragm valve in the three-way nozzle carrier.

(7) Nozzle filter; fitted as standard on machines with 50 mesh/inch.

(8) Rubber seal.

(9) Bayonet cap.

(10) O-ring.

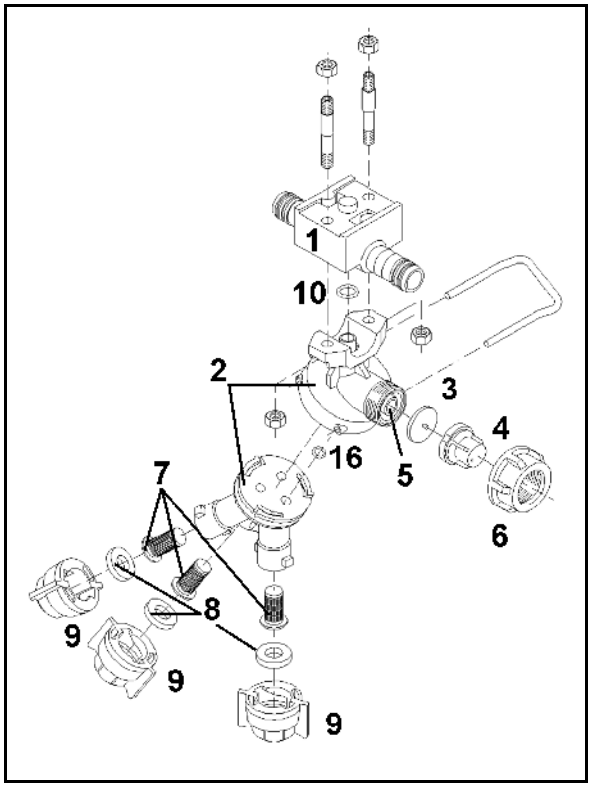


Fig. 95

6.8.4 Electric boundary nozzles (optional)

Using boundary nozzle switching, the last nozzle can be switched off from the tractor and a boundary nozzle can be electrically switched on 25 cm further out (right at the edge of the field).

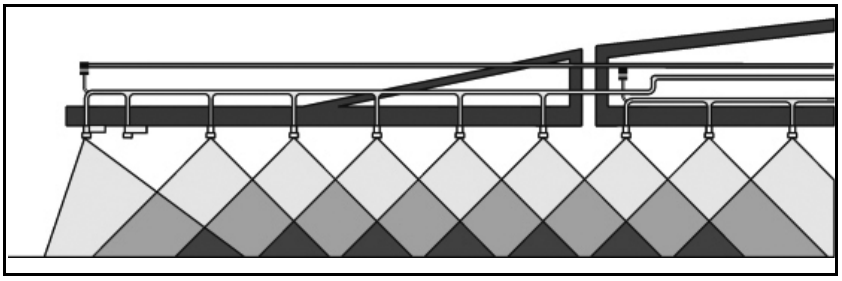


Fig. 96

6.8.5 Electric end nozzle switching (optional)

Using end nozzle switching, up to three of the outer nozzles at the edge of the field close to a water source can be electrically switched off from the tractor).

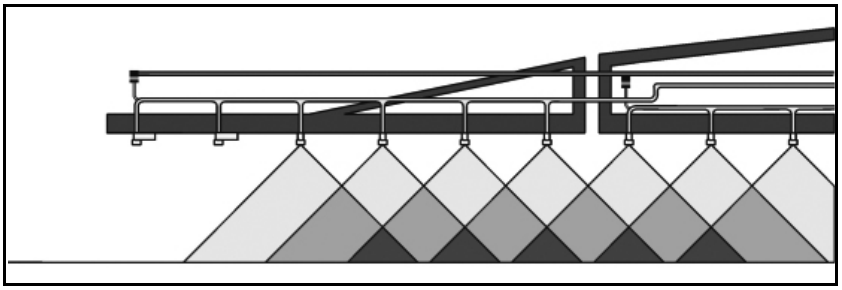


Fig. 97

6.8.6 Electric additional nozzle switching (optional)

With the additional nozzle switching, another exterior nozzle is cut in, increasing the working width by one metre.

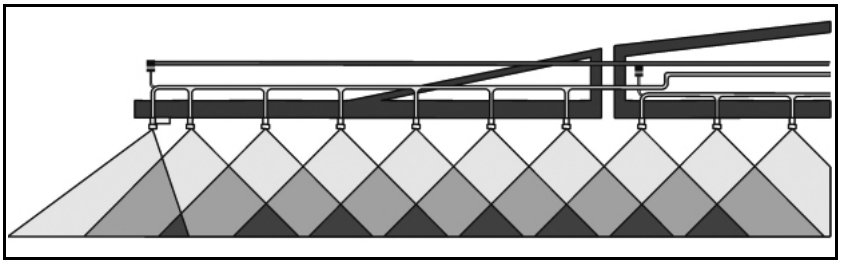


Fig. 98

6.9 Special optional equipment for liquid fertiliser

There are currently two main types of liquid fertiliser available:

- Ammonium nitrate / urea solution (AUS) with 28 kg N per 100 kg AUS.
- An NP solution 10-34-0 with 10 kg N and 34 kg P_2O_5 per 100 kg NP solution.

If the liquid fertiliser is sprayed using flat-fan nozzles, multiply the corresponding values from the spray table for the spray rate (l/ha) by 0.88 for AUS and by 0.85 for NP solutions, as the spray rates listed (in l/ha) only apply for water.

As a rule:

Use coarse-dropped application for liquid fertiliser to avoid chemical burns to the plants. Overly large drops roll off the leaf and drops which are too small cause a magnifying glass effect, which burns the leaves. Too much fertiliser may cause burns to appear on the leaves due to the salt concentration in the fertiliser.

As a rule, do not spray more liquid fertiliser than, for example, 40 kg N (see also "Conversion table for spraying liquid fertiliser"). Always discontinue nozzle-based AUS fertilisation at development stage EC-39, because chemical burns on ears have a particularly bad effect.

6.9.1 Three-ray nozzles (optional)

The use of three-ray nozzles for applying liquid fertiliser is beneficial if the liquid fertiliser needs to be taken up more by the roots of the plant than through the leaves.

Thanks to its three openings, the dosing aperture, which is integrated into the nozzle, ensures a coarse-dropped, almost depressurised distribution of the liquid fertiliser. This prevents an undesirable spray mist and the formation of smaller drops. The coarse drops produced by the three-ray nozzle hit the plants with little force and roll off their surface. **Although this avoids damage from burns to the greatest extent possible, avoid the use of three-ray nozzles for late top dressing and use drag hoses.**

For all three-ray nozzles listed in the following, only use the black bayonet nut.

Different three-ray nozzles and their operational areas (at 8 km/h)

- yellow 50 - 80l AUS / ha
- red 80 - 126l AUS / ha
- blue 115 - 180l AUS / ha
- white 155 - 267l AUS / ha

6.9.2 7 hole nozzles / FD nozzles (optional)

The same conditions apply for using 7 hole nozzles / FD nozzles as for the three-ray nozzles. In contrast to the three-ray nozzle, in the case of the 7 hole nozzle / FD nozzles, the outlets are not oriented downwards, but instead point to the side. This allows very large drops to be produced on the plants using only slight impact forces.

Fig. 99: → 7 hole nozzle

Fig. 100: → FD nozzle

Fig. 99

Fig. 100

The following 7-hole nozzles are available

- SJ7-02-CE 74 – 120l AUS (at 8 km/h)
- SJ7-03-CE 110 – 180l AUS
- SJ7-04-CE 148 – 240l AUS
- SJ7-05-CE 184 – 300l AUS
- SJ7-06-CE 222 – 411l AUS
- SJ7-08-CE 295 – 480l AUS

The following FD nozzles are available

- FD 04 150 - 240 l AHL/ha (at 8 km/h)
- FD 05 190 - 300 l AHL/ha
- FD 06 230 - 360 l AHL/ha
- FD 08 300 - 480 l AHL/ha
- FD 10 370 - 600 l AHL/ha*

6.9.3 Drag hose equipment for Super-S boom (optional)

Drag hose unit with dosing discs (no. 4916-39) for late top dressing with liquid fertiliser

Fig. 101

Fig. 101

(1) Numbered, separate drag hose part width sections with 25 cm nozzle distance and hose distance. No. 1 on the left-hand side is fitted on the outside (looking in the direction of travel), no. 2 next to it and so on.

(2) Thumb nuts for securing the drag hose unit.

(3) Turned plug connection for connecting the hoses.

(4) Metal weights - stabilise the position of the hoses during operation.

The dosing discs determine the spray rate [l/ha].

The following dosing discs are available

- 4916-26 dia. 0.65 50 - 104 l AUS/ha (at 8 km/h)
- 4916-32 dia. 0.8 80 - 162 l AUS/ha
- 4916-39 dia. 1.0 115 - 226 l AUS/ha (standard)
- 4916-45 dia. 1.2 150 - 308 l AUS/ha
- 4916-55 dia. 1.4 225 - 450 l AUS/ha

Refer to the section "Spray table for the drag hose unit", on page 230.

6.9.4 Drag hose equipment for Super-L boom (optional)

- with dosing discs for late top dressing with liquid fertiliser

Fig. 102/...

(1) Drag hoses at 25 cm intervals, after fitting the 2nd spray line.

(2) Bayonet connection with dosing discs.

(3) Metal weights - stabilise the position of the hoses during operation.

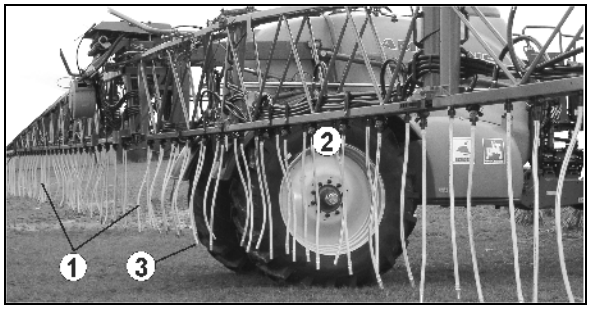


Fig. 102

Fig. 103/...

(1) Deflector hoop for the transport position.

(2) Transport position raised by lowering the transport hook

(3) Spacing runners

Remove both spacing runners (Fig. 103/3) when operating drag hoses.

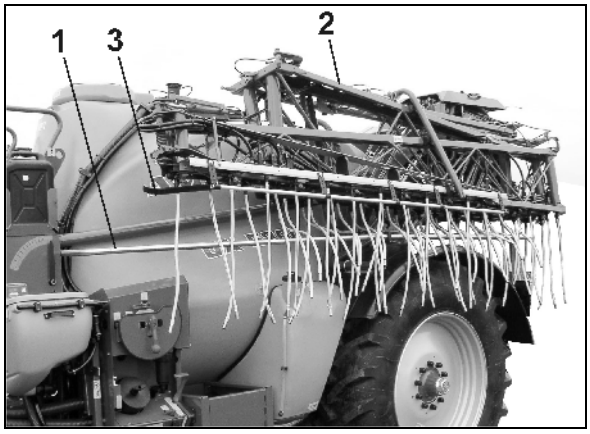


Fig. 103

Fig. 104/...

(1) one setting tap for every boom part width section:

- **a** Spraying via both spray lines with drag hoses
- **b** Spraying via a standard spray line
- **c** Spraying via the 2nd spray line only

Remove drag hoses for normal spraying operation.

After removing the drag hoses, seal off the nozzle bodies with blanks

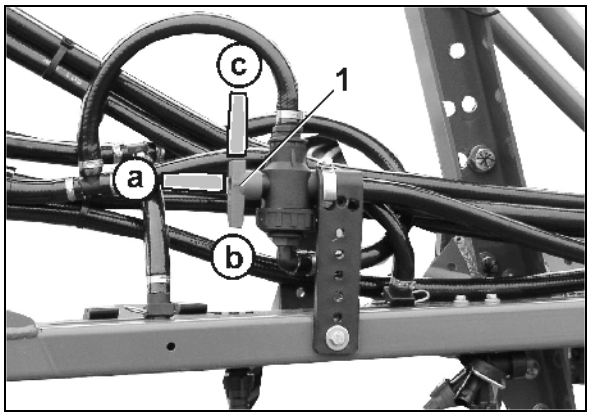


Fig. 104

Fig. 105/...

(1) Transport hook

Screw on both transport hooks lower down when operating drag hoses. In transport position, the distance between nozzle and mud guard must be 20 cm.
For normal spraying, screw both transport hooks back into the original position.

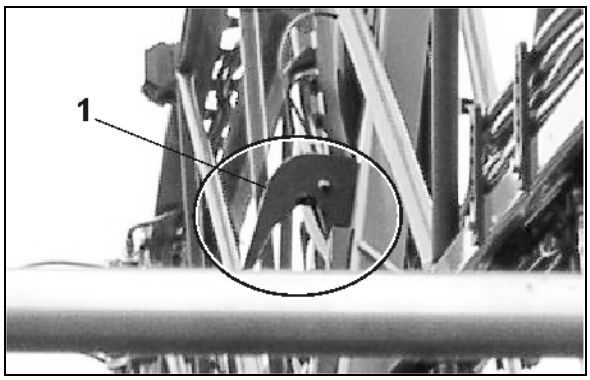


Fig. 105

6.10 High-Flow high performance liquid fertiliser application

- Spray rate can be increased (optional) for applying liquid fertiliser. The maximum spray rate can be increased to up to 400 l/min.
- The agitator pump is used here to increase the spray rate, and is not (or only partly) used as a drive for the agitator.
- The high-performance liquid fertiliser application is switched on and off via the **Amatron+**.

1. High-Flow spray line switch tap
2. Switch tap for agitator / draining residue
3. Switch tap for non-return lock
4. Spraying pump
5. Agitator pump
6. Pressure relief valve
7. Control valve for agitator pump spray rate
8. Additional pressure filter
9. Drain hose
10. Control box

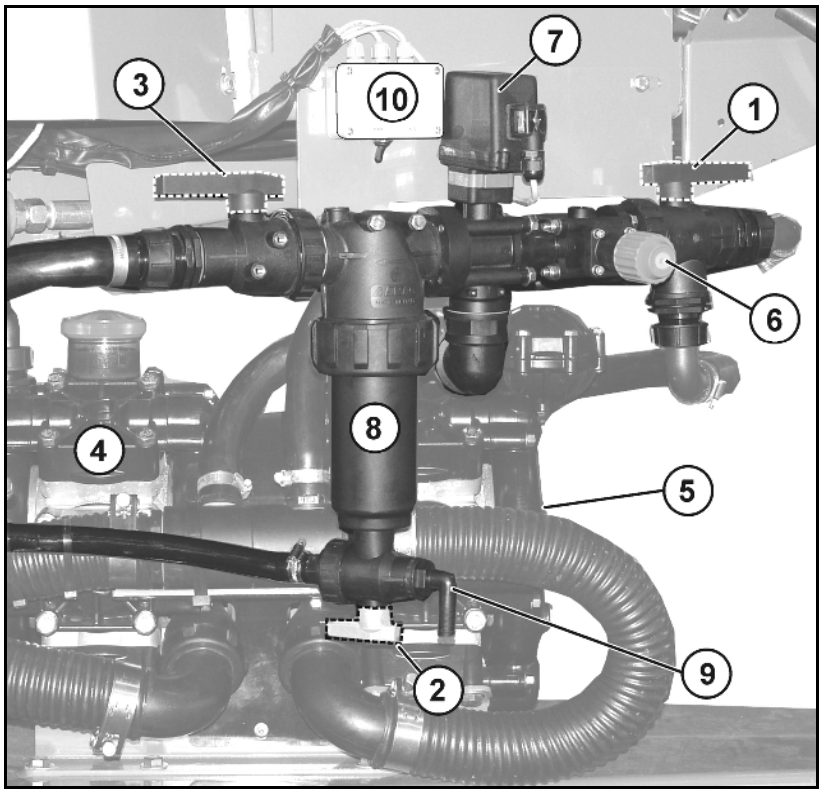


Fig. 106

Switch taps

Fig. 107/1: **High-Flow switch tap**

- Position A: **High-Flow** spray line ON
- Position B: **High-Flow** spray line OFF (main agitator ON)

Fig. 107/2: **Switch tap for non-return lock**

- Position A: **High-Flow** spray line open (for NTS mode)
- Position B: **High-Flow** spray line closed

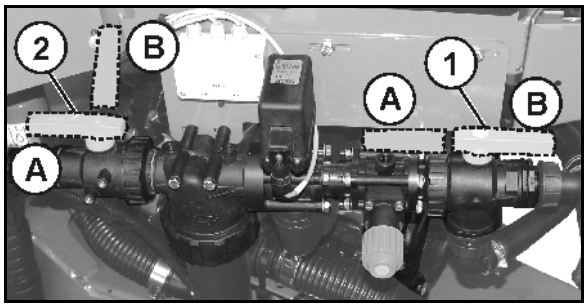


Fig. 107

Fig. 108/2: **Agitator switch tap**

- Position A: Main agitator ON full.
- Position B: Main agitator completely OFF, maximum spray rate.

> The switch tap divides the flow rate into agitator and **High-Flow** fertilisation. It can be set anywhere between positions A and B.

- Position C: Drain **High-Flow** equipment.

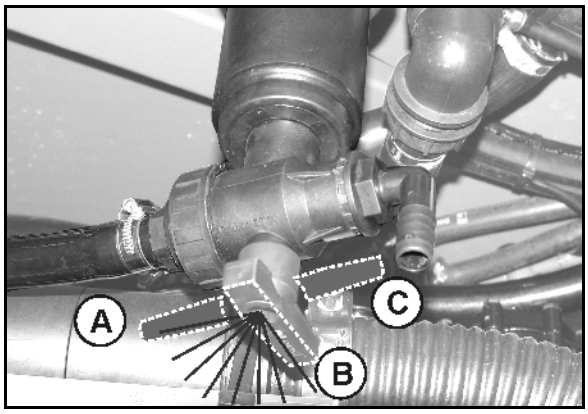


Fig. 108

Control box with switch

- Position A: **High-Flow** spray line ON
- Position B: **High-Flow** spray line OFF

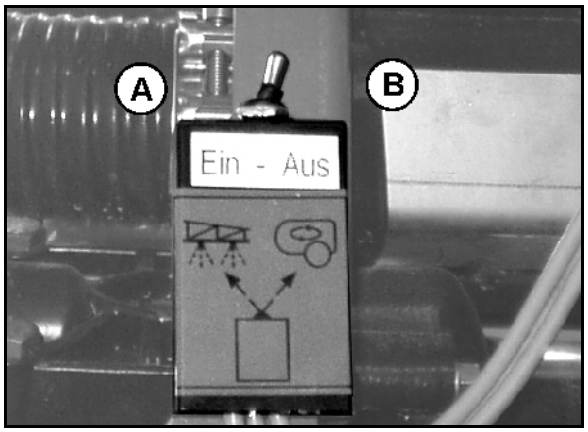


Fig. 109

Use

To switch on the High-Flow spray line to increase the maximum spray rate, proceed as follows:

1. In **AMATRON+**, switch High-Flow fertilisation **ON**.
2. Move switch on the control box to position **A.**
3. High-Flow switch tap to position **A.**
4. Open switch tap for non-return lock, position **A**
5. Set agitator switch tap to anywhere between positions **A** and **B**.
6. Select spray line switch tap for both spray lines, position **A**.

For normal spraying operation:

1. In **AMATRON+**, switch High-Flow fertilisation **OFF**.
2. Switch on control box to position **B.**
3. Close non-return lock switch tap, position **B**
4. High-Flow switch tap to position **B.**

The setting tap for the main agitator (Fig. 110/**H**) on the control terminal does not work when the High-Flow spray line is switched ON.

→ Use agitator switch tap (Fig. 110/**I**).

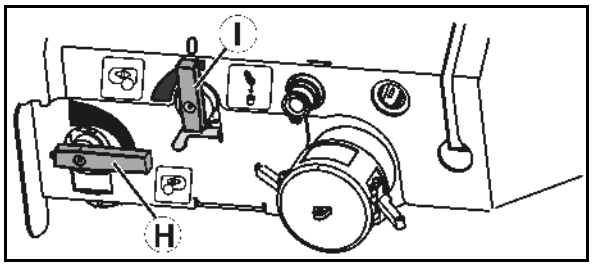


Fig. 110

The **AMATRON+** will display the wrong spray rate for High-Flow fertilisation if

- High-Flow fertilisation is switched ON/OFF by mistake on the **AMATRON+**.
- the switch on the control box has been set to position **A** / **B**.

Maintenance and repair

Drain the High-Flow equipment

- before cleaning the pressure filter,
- when placing into winter storage or out of operation for a lengthy period.

Move agitator switch tap (Fig. 111/1) to position **C**.

→ Residue drains out.

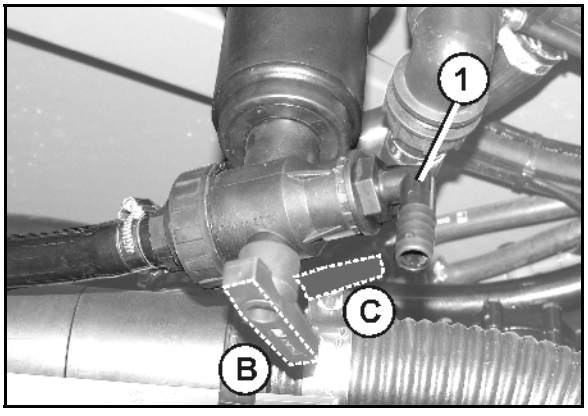


Fig. 111

6.11 Foam marker (optional)

The **foam marker** (Fig. 112/1 and Fig. 112/3), which can be retrofitted at any point, makes it possible to **drive the next bout precisely** when spraying **fields without marked-out tramlines**.

Marking involves the use of **foam bubbles**. The foam bubbles are laid at adjustable intervals of approx. 10 – 15 metres, providing a **clearly-visible orientation line**. The foam bubbles dissolve after a certain time without leaving any residue behind.

Set the **interval between the individual applications of bubbles** using the slotted screw as follows:

- o turn **clockwise** - distance is increased,
- o turn **anti-clockwise**, - distance is decreased.

Foam marker:

- **Super-S boom Fig. 112/...:**
- **Super-L boom Fig. 113/...**

(1) Tank

(2) Slotted screw

(3) Compressor

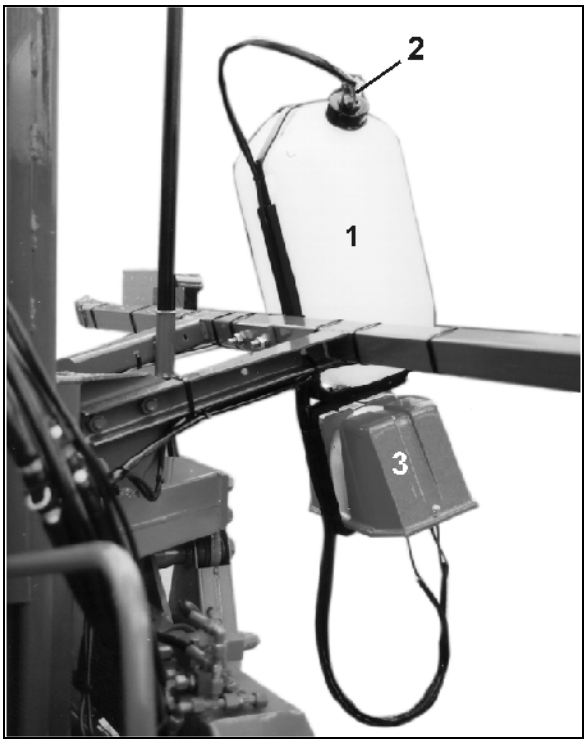


Fig. 112

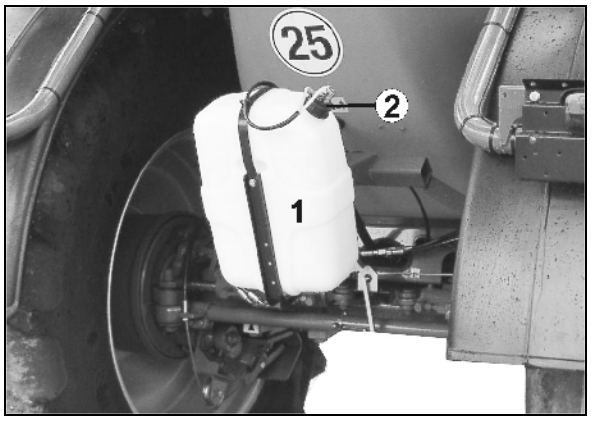


Fig. 113

Fig. 114/...

(1) Air and liquid agitator

(2) Flexible plastic nozzle

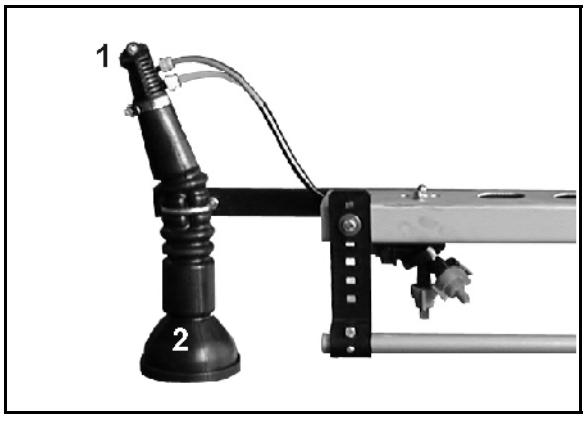


Fig. 114

See also **AMATRON+** operating manual

Operating device

For machines without **AMATRON+**:

Fig. 115/...

(1) Left-hand foam marker on

(2) Right-hand foam marker on

(3) Foam marker off

(4) Connection to the compressor

(5) Connection to the tractor power supply

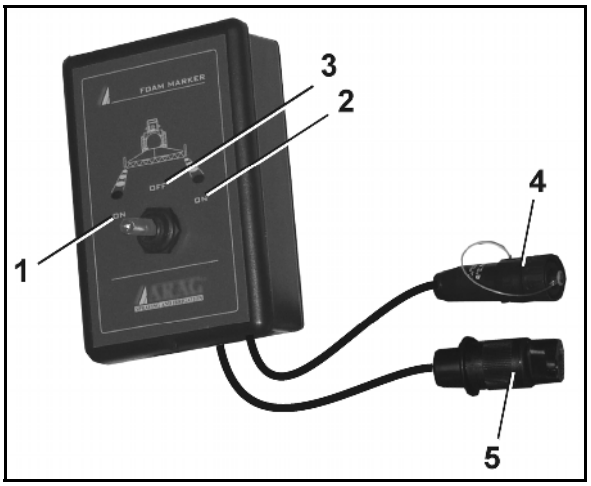


Fig. 115

6.12 Pressure circulating system (DUS) (optional)

- For normal spraying operation, the pressure circulating system should usually be switched on.
- When using drag hoses, the pressure circulating system should usually be switched off.

The pressure circulating system

- enables the constant circulation of liquid in the spray line. For these purposes, a suction port hose (Fig. 116/1) is assigned to each part width section.
- enables operation using spray liquid or flushing water, as desired.
- reduces the undiluted residue for all spray lines to 2 l.

The constant circulation of liquid

- enables production of an even spray pattern right from the start, because spray liquid is available at every spraying nozzle immediately after the sprayer boom is switched on, with no delay.
- prevents damage to the spray line.

The principal components of the pressure circulating system are:

- one suction port hose (Fig. 116/1) per part width section.
- the DUS switch tap (Fig. 117/1).
- the DUS pressure relief valve (Fig. 117/2). The DUS pressure relief valve is permanently set at the factory and reduces the pressure in the pressure circulating system to 1 bar.

→ If the DUS switch tap is in position (Fig. 117/A), the pressure circulating system is switched ON.

→ If the DUS switch tap is in position (Fig. 117/B), the pressure circulating system is switched OFF.

→ If the DUS switch tap is in position (Fig. 117/C), liquid can be drained from the field sprayer.

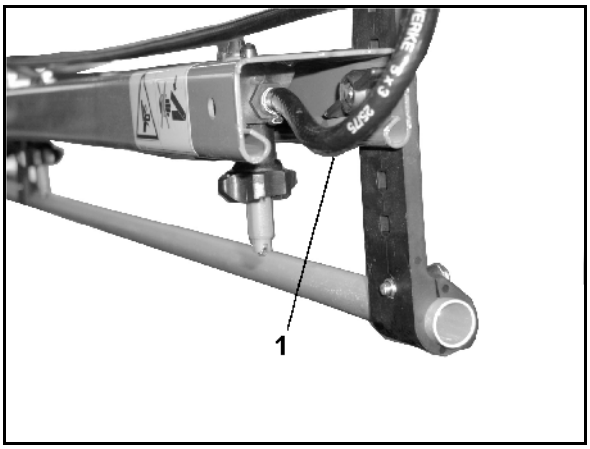


Fig. 116

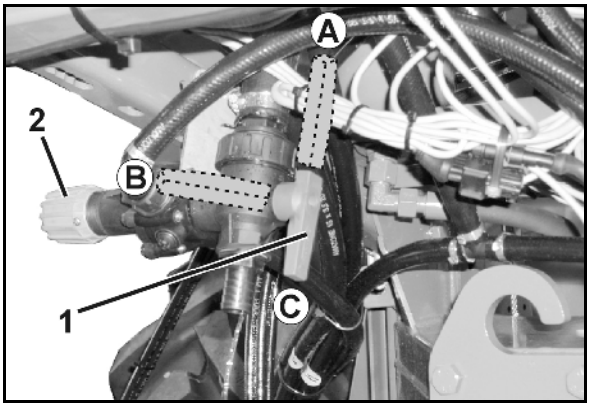


Fig. 117

Overview – pressure circulating system (DUS)

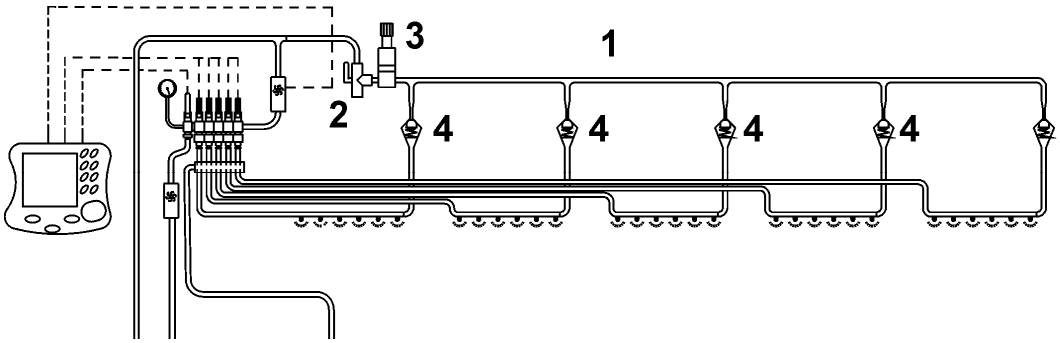


Fig. 118

(1) Pressure circulating system (DUS)

(2) DUS switch tap

(3) DUS pressure limiting valve

(4) DUS return valve

6.13 Line filter for spray lines (optional)

Line filters (Fig. 119/1) are

- fitted in the spray lines in each part width section.
- an additional measure to avoid contamination of the spraying nozzles.

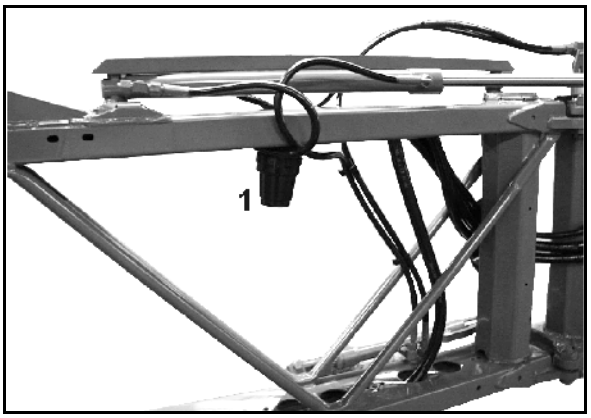


Fig. 119

Overview of the filter inserts

- Filter insert with 50 mesh/inch (blue)
- Filter insert with 80 mesh/inch (grey)
- Filter insert with 100 mesh/inch (red)

7 Commissioning

This section contains information

- on commissioning your machine.
- on checking if it is possible to connect the machine to your tractor.

- Before operating the machine for the first time the operator must have read and understood the operating manual.
- Comply with the section "Safety information for the user", starting on page 30 when
  - coupling and uncoupling the machine
  - transporting the machine
  - using the machine
- Only couple and transport the machine to a tractor which is suitable for the task.
- The tractor and machine must meet the national road traffic regulations.
- The operator and the user shall be responsible for compliance with the statutory road traffic regulations.

WARNING

Risk of crushing, shearing, cutting, and being drawn in or trapped in the vicinity of hydraulically or electrically actuated components.

Do not block the operator controls on the tractor which are used for hydraulic and electrical movements of components, e.g. folding, swivelling and pushing movements. The movement must stop automatically when you release the appropriate control. This does not apply to equipment movements that:

- are continuous or
- are automatically locked or
- require a floating position or pressed position to function

7.1 Checking the suitability of the tractor

WARNING

Risk of breaking during operation, insufficient stability and insufficient tractor steering and braking power from improper use of the tractor.

- Check the suitability of your tractor, before connecting the machine to the tractor.

  You may only connect the machine to tractors suitable for the purpose.

- Carry out a brake test to check whether the tractor achieves the required braking rate with the machine connected.

Requirements for the suitability of a tractor are, in particular:

- Permissible total weight
- Permissible approved axle loads
- Permissible drawbar load at the tractor coupling point
- Load capacity of the tyres fitted
- The approved trailer load must be sufficient

  You can find this data on the rating plate or in the vehicle documentation and in the tractor operating manual.

The front axle of the tractor must always be subjected to at least 20% of the dead-weight of the tractor.

The tractor must achieve the brake rate specified by the tractor manufacturer, even with the machine connected.

7.1.1 Calculating the actual values for the total tractor weight, tractor axle loads and tyre load capacities, as well as the minimum ballast

The permissible total tractor weight, specified in the vehicle documentation, must be greater than the sum of the

- Tractor empty weight,
- Ballast weight and
- Total weight of the connected machine or drawbar load of the connected machine

This information is only valid for the Federal Republic of Germany:

If, having tried all possible alternatives, it is not possible to comply with the axle loads and / or the permissible total weight, then a survey by an officially-recognised motor vehicle traffic expert can, with the approval of the tractor manufacturer, be used as a basis for the authority responsible to issue an exceptional approval according to § 70 of the German Regulations Authorising the Use of Vehicles for Road Traffic and the required approval according to § 29, paragraph 3 of the German Road Traffic Regulations.

7.1.1.1 Data required for the calculation

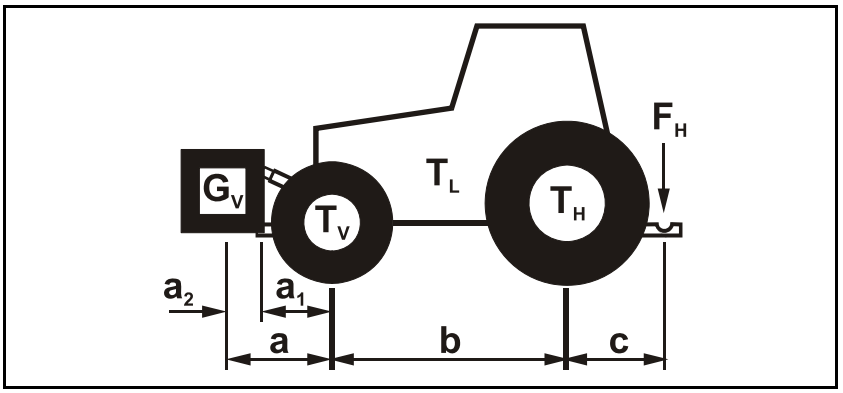


Fig. 120

T_L	[kg]	Tractor empty weight	See tractor operating manual or vehicle documentation
T_V	[kg]	Front axle load of the empty tractor	
T_H	[kg]	Rear axle load of the empty tractor	
G_V	[kg]	Front weight (if available)	See front weight in technical data, or weigh
F_H	[kg]	Maximum drawbar load	See technical data of machine
a	[m]	Distance between the centre of gravity of the front machine mounting or the front ballast and the centre of the front axle (total $a_1 + a_2$)	See technical data of tractor and front machine mounting or front ballast or measurement
a_1	[m]	Distance from the centre of the front axle to the centre of the lower link connection	See tractor operating manual or measurement
a_2	[m]	Distance between the centre of the lower link connection point and the centre of gravity of the front machine mount or front ballast (centre of gravity distance)	See technical data of front machine mounting or front ballast or measurement
b	[m]	Tractor wheel base	See tractor operating manual or vehicle documents or measurement
c	[m]	Distance between the centre of the rear axle and the centre of the lower link connection	See tractor operating manual or vehicle documents or measurement

7.1.1.2 Calculation of the required minimum ballasting at the front $G_{V\ min}$ of the tractor for assurance of the steering capability

$$G_{V\ \min} = \frac{F_H \bullet c - T_V \bullet b + 0{,}2 \bullet T_L \bullet b}{a + b}$$

Enter the numeric value for the calculated minimum ballast $G_{V\ min}$, required on the front side of the tractor, in the table (Section 7.1.1.7).

7.1.1.3 Calculation of the actual front axle load of the tractor $T_{V\ tat}$

$$T_{V\ tat} = \frac{G_V \bullet (a + b) + T_V \bullet b - F_H \bullet c}{b}$$

Enter the numeric value for the calculated actual front axle load and the approved tractor front axle load specified in the tractor operating manual in the table (Section 7.1.1.7).

7.1.1.4 Calculation of the actual total weight of the combined tractor and machine

$$G_{tat} = G_V + T_L + F_H$$

Enter the numeric value for the calculated actual total weight and the approved total tractor weight specified in the tractor operating manual in the table (Section 7.1.1.7).

7.1.1.5 Calculation of the actual rear axle load of the tractor $T_{H\ tat}$

$$T_{H\ tat} = G_{tat} - T_{V\ tat}$$

Enter the numeric value for the calculated actual rear axle load and the approved tractor rear axle load specified in the tractor operating manual in the table (Section 7.1.1.7).

7.1.1.6 Tyre load capacity

Enter the double value (two tyres) of the approved load capacity (see, for example, tyre manufacturer's documentation) in the table (Section 7.1.1.7).

7.1.1.7 Table

	Actual value according to calculation		Permissible value according to tractor operating manual		Double the permissible load capacity (two tyres)
Minimum ballast front / rear	/ kg		--		--
Total weight	kg	≤	kg		--
Front axle load	kg	≤	kg	≤	kg
Rear axle load	kg	≤	kg	≤	kg

- You can find the permissible values for the total tractor weight, axle loads and load capacities in the tractor registration papers.
- The actually calculated values must be less than or equal to (≤) the permissible values.

WARNING

Risk of crushing, cutting, being caught or drawn in, or impact through insufficient stability and insufficient tractor steering and brake power.

It is forbidden to couple the machine to the tractor used as the basis for calculation, if

- one of the actual, calculated values is greater than the permissible value.
- there is no front ballast (if required) attached to the tractor for the minimum front ballast ($G_{V\,min}$).

- You must use a front weight, which is equal to at least the required minimum front ballast ($G_{V\,min}$).

7.1.2 Requirements for tractor operation with attached machines

WARNING

Risk of breakage during operation of components through unapproved combinations of connecting equipment.

- Ensure:
  - o that the connection fitting on the tractor possesses a permissible drawbar load sufficient for the actual drawbar load.
  - o that the axle loads and weights of the tractor altered by the drawbar load are within the approved limits. If necessary, weigh them.
  - o that the tractor's actual static rear axle weight does not exceed the permissible rear axle weight.
  - o that the permissible total weight of the tractor is observed
  - o that the approved load capacities of the tractor tyres are not exceeded.

7.1.2.1 Combination options for connection fittings and towing eyes

Fig. 121 shows permitted combination options for joining the connection fitting on the tractor and the towing eye on the machine in relation to the maximum permitted drawbar load.

You will find the maximum permitted drawbar load in the vehicle documentation or on the rating plate on the connection fitting of your tractor.

Maximum permissible drawbar load	Connection fitting on the tractor	Towing eye on the fixed drawbar trailer
2000 kg	Pin coupling DIN 11028 / ISO 6489-2	Towing eye 40 for hydraulic high-lift drawbar DIN 11043
	Non-automatic pin coupling DIN 11025	
3000 kg - ≤ 40 km/h 2000 kg - > 40 km/h	Trailer hook (hitch hook) ISO 6489-1	Towing eye (hitch ring) ISO 5692-1
	Trailer peg (Piton-fix) ISO 6489-4	
	Ball coupling 80	Ball bracket 80

Fig. 121

7.1.2.2 Calculating the actual D_C value for the combination to be coupled

WARNING

Risk of breakage of the connection fitting between tractor and machine due to improper use of the tractor.

Calculate the actual D_C value for your combination, made up of tractor and machine, to check whether the connection fitting on your tractor displays the required D_C value. The actual calculated D_C value for the combination must be less than or equal to (≤) the given D_C value of the connection fitting of your tractor.

The actual D_C value of a combination to be coupled is calculated as follows:

$$D_C = g \times \frac{T \times C}{T + C}$$

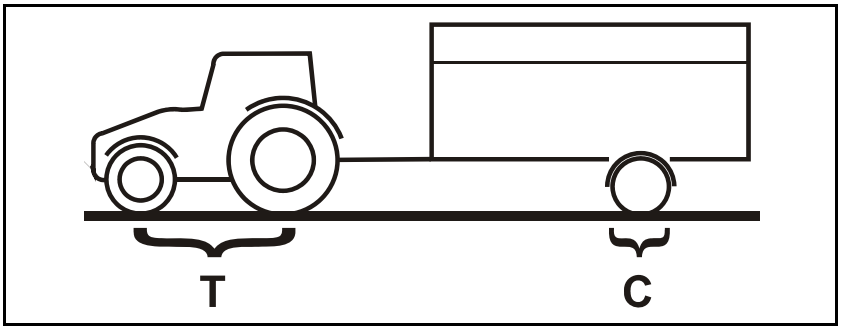


Fig. 122

T: Permissible total weight of your tractor in [t] (see tractor operating manual or registration papers)

C: Axle load of the machine loaded with the permitted mass (payload) in [t], without drawbar load

g: Acceleration due to gravity (9.81 m/s²)

Actual calculated D_C value for the combination		**D_C value given on the tractor for the connection fitting**
KN	≤	KN

You can find the D_C value for the connection fitting on the connection fitting itself / in the operating manual for your tractor.

7.1.3 Machines without their own brake system

WARNING

Risk of crushing, cutting, being caught or drawn in, or impact through inadequate brake power of your tractor.

The tractor must achieve the brake rate specified by the tractor manufacturer, even with the machine connected.

If the machine does not possess its own brake system:

- Then the actual tractor weight must be greater than or equal to (≥) the actual weight of the connected machines.

  In many countries, other regulations apply. In Russia, for example, the weight of the tractor must be double that of the attached machine.

- The maximum operational speed is 25 km/h.

7.2 Adjusting the length of the PTO shaft to the tractor

WARNING

Danger from

- **damaged and/or destroyed, flying parts for the operator / third party if the PTO shaft is compressed or pulls apart while the machine coupled to the tractor is being raised/lowered, because the length of the PTO shaft has not been adjusted properly.**
- **being caught and drawn in if the PTO shaft is installed incorrectly or if unauthorised design changes are made.**

Have the length of the PTO shaft checked in all operating positions by a specialist workshop and, if necessary, adjusted before coupling the PTO shaft to your tractor for the first time.

Always observe the operating manual supplied with the PTO shaft when adjusting the PTO shaft.

This adjustment of the PTO shaft applies only for the current tractor type. You may need to readjust the PTO shaft if you couple the machine to another tractor.

WARNING

Risk of being caught and drawn in if the PTO shaft is installed incorrectly or if unauthorised design changes are made.

Only a specialist workshop may make design changes to the PTO shaft. When doing so, read and follow the operating manual from the manufacturer.

Adjusting the length of the PTO shaft is permitted with consideration of the minimum profile overlap.

Design changes to the PTO shaft that are not described in the operating manual from the PTO shaft manufacturer are not permitted.

WARNING

Risk of crushing between the rear of the tractor and the machine when raising and lowering the machine to determine the shortest and longest operating position of the PTO shaft.

Only actuate the operator controls for the tractor's three-point linkage

- from the intended workstation.
- if you are outside of the danger area between the tractor and the machine.

WARNING

Risk of crushing from unintentional:

- **rolling of the tractor and the connected machine.**
- **lowering of the raised machine.**

Secure the tractor and machine from unintentionally starting or rolling and secure the raised machine against unintentional lowering before entering the danger zone between the tractor and raised machine in order to adjust the PTO shaft.

The PTO shaft is at its shortest when it is horizontal. The PTO shaft is at its longest when the machine is fully lifted.

1. Couple the tractor to the machine (do not connect the PTO shaft).
2. Apply the tractor's parking brake.
3. Determine the clearance height of the machine with the shortest and longest operating position for the PTO shaft.
   3.1 To do so, raise and lower the machine via the tractor's three-point hydraulic system.
   While doing so, actuate the manual controls for the tractor's three-point hydraulic system on the rear of the tractor, from the provided workstation.
4. Secure the machine, lifted in the measured clearance height, against unintentional lowering (for example, by supporting it or hooking it to a crane).
5. Secure the tractor from unintentional starting before entering the danger area between the tractor and machine.
6. When measuring the length and shortening the PTO shaft, read and follow the operating manual from the PTO shaft manufacturer.
7. Put the shortened halves of the PTO shaft back together.
8. Grease the universal joint shaft of the tractor and the gearbox input shaft before connecting the PTO shaft.
   The tractor symbol on the protective tube of the PTO shaft identifies the tractor-side connection of the PTO shaft.

7.3 Securing tractor / machine against accidental starting and rolling

WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact when making interventions in the machine, through

- **unintentional falling of the unsecured machine raised using the tractor's three-point linkage.**
- **unintentional falling of raised, unsecured machine parts.**
- **unintentional start-up and rolling of the tractor-machine combination.**
- Secure the tractor and the machine against unintentional start-up and rolling before making any intervention in the machine.
- It is forbidden to make any intervention in the machine, such as installation, adjustment, troubleshooting, cleaning, maintenance and repairs
  - when the machine is running
  - for as long as the tractor engine is running with a connected PTO shaft / hydraulic system.
  - when the ignition key is inserted in the tractor and the tractor engine with the connected PTO shaft / hydraulic system could be started unintentionally.
  - when the tractor and machine are not secured against unintentional rolling using their parking brakes and/or wheel chocks.
  - when moving parts are not locked against unintentional movement.

  When carrying out such work, there is a high risk of contact with unsecured components.

1. Lower the raised, unsecured machine / raised, unsecured parts of the machine.

→ This is how to prevent unintentional falling:

2. Shut down the tractor engine.
3. Remove the ignition key.
4. Apply the tractor's parking brake.
5. Secure the machine against unintentional rolling (only attached machine)
   - On flat ground using the parking brake (if present) or wheel chocks.
   - On uneven ground or slopes using the parking brake and wheel chocks.

7.4 Fitting wheels

If the machine is fitted with inflatable spare tyres, running wheels must be fitted before putting into operation.

WARNING

- **Only one permitted set of tyres may be used, as specified in the technical data (see page 56).**
- **Wheel rims that are suitable for the tyres used must have a rim that has been fully welded all the way round.**

- A hydraulic stand extension and ladder extension must be fitted in the case of tyres with a diameter greater than 1860 mm.
- Depending on the wheel track, the locking screw must be fitted if there is a steering axle, see page 82.

1. Lift machine slightly using lifting crane.

DANGER

Use the attachment points marked for lifting belts.

See also "Loading" section, page 40.

2. Loosen wheel nuts on the inflatable spare tyres.
3. Remove inflatable spare tyres.

CAUTION

Take care when removing the inflatable spare tyres and putting the running wheels in place.

4. Place the running wheels on threaded bolts.
5. Tighten wheel nuts.

Required tightening torque for wheel nuts: 510 Nm.

6. Lower machine and remove lifting belts.
7. After 10 operating hours, tighten wheel nuts.

7.5 Initial operation of service brake system

Perform a brake test while the trailed sprayer is empty, and again when it is loaded to test the braking behaviour of the tractor with coupled trailed sprayer.

We recommend that you have a specialist workshop coordinate the brakes on the tractor and trailed sprayer in order to attain optimum braking and minimum wear to brake linings (see "Maintenance" section, page 196).

7.6 Adjusting the system setting screw on the hydraulic block

- **Profi-folding only:**

Always adjust the system setting screw to the hydraulic system on your tractor. Increased hydraulic fluid temperatures are the result of an incorrectly adjusted system setting screw, caused by constant strain on the tractor hydraulics pressure relief valve.

Fig. 123/...

(1) System converting bolt

(2) LS connection for load sensing control line

Fig. 124/...

(1) Tractor connection for load sensing control line

(2) Tractor connection for the load sensing pressure hose

(3) Tractor connection for the pressure-free return flow

The tractor hydraulic system available determines the setting of the system setting screw on the hydraulic block (Fig. 123/1).

Depending on the tractor hydraulic system, the system setting screw must be

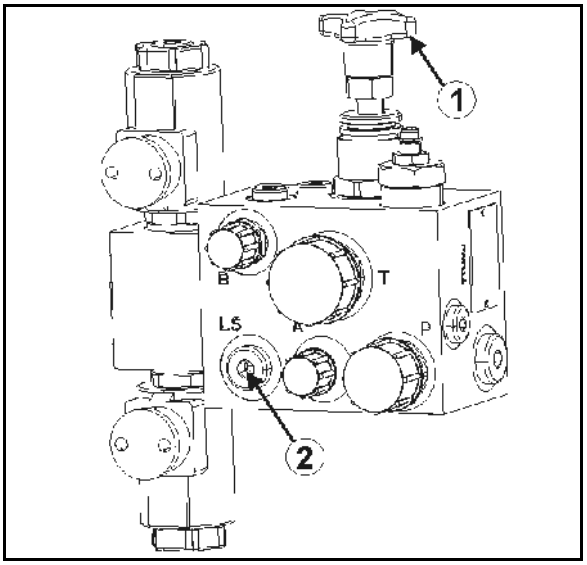


Fig. 123

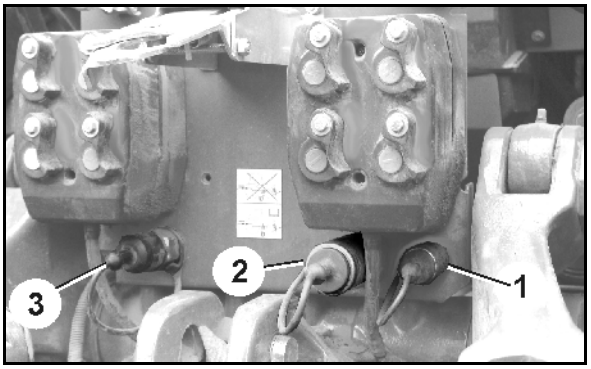


Fig. 124

- **screwed out** up to the stop (factory setting) on tractors with
  - open-centre hydraulic system (constant flow system, geared pump hydraulics).
  - setting pump with adjustable oil extraction via the control unit
- **screwed in** up to the stop (in contrast to the factory setting) on tractors with
  - closed-centre hydraulic system (constant pressure system, pressure regulated setting pump).
  - load-sensing hydraulic system (pressure and power controlled setting pump) with direct load-sensing pump connection. Using the flow control valve on the tractor, adjust the actual flow rate to the required flow rate.

- The machine must be depressurised before making adjustments.
- The hydraulic block can be found at the front on the right of the machine, behind the cover plate.

7.7 Trail-Tron position encoder

If using Trail-Tron, a holder for the position encoder (Fig. 125/1) must be fitted to the tractor.

The holder must be made according to the actual circumstances of the tractor with the sleeve with locking screw (Fig. 125/2) and metal plate (Fig. 125/3) provided.

When installed, the position encoder must be directly above the pivot point of the tractor pin coupling (Fig. 125/4).

- Keep the distance between the coupling point and position encoder (Fig. 126/ X) as small as possible (particularly with the hitch drawbar).
- In neutral position with the machine coupled, the rod of the position encoder must be pulled approximately 100 mm out of the holder.

  If necessary, fasten the holder in an alternative position.

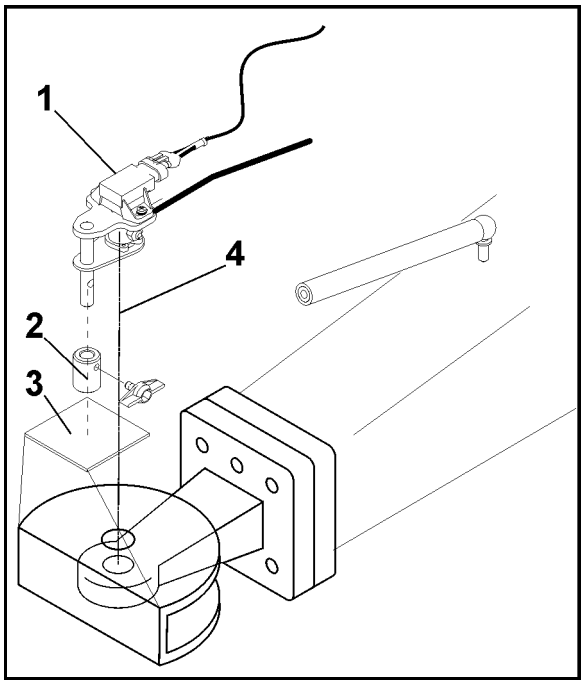


Fig. 125

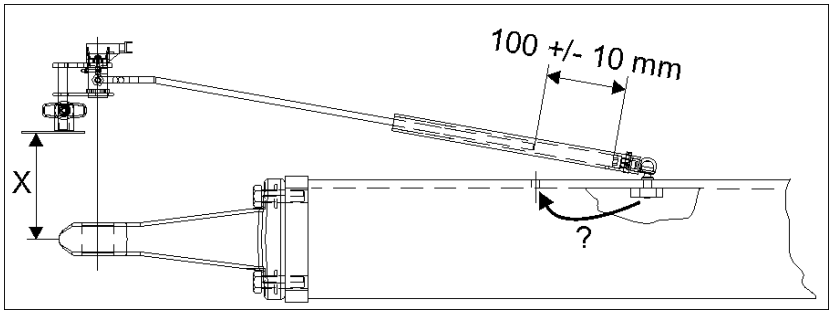


Fig. 126

7.8 Track setting of the adjustable axle (workshop task)

Adjust the track width of the implement so that the wheels of the sprayer run in the middle of the tractor's wheel tracks.

The track width (with 100 mm offset) is variably adjustable from 1,500 mm to 2,250 mm.

The adjustable track widths depend upon the wheel assembly (Fig. 127):

- Variable from 1,500 mm to 1,960 mm with wheel assembly according to position 1.
- Variable from 1,700 mm to 2,250 mm with wheel assembly according to position 2.

Tighten the wheel bolts with a torque of 510 Nm.

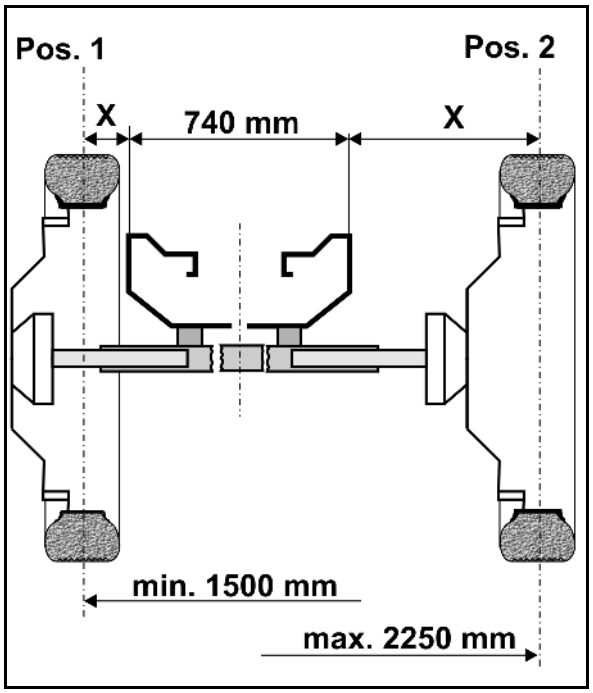


Fig. 127

$$X = \frac{\text{Desired track width [mm]} - 740\ \text{[mm]}}{2}$$

Perform the track width adjustment as follows

Axle without brake system:

1. Hang the sprayer on the tractor.
2. Secure the tractor / implement against unintentional starting and rolling away.
3. Lift the sprayer on one side using a jack until the respective wheel lifts from the ground.

WARNING

Position the jack under the sprayer frame and not under the axle!

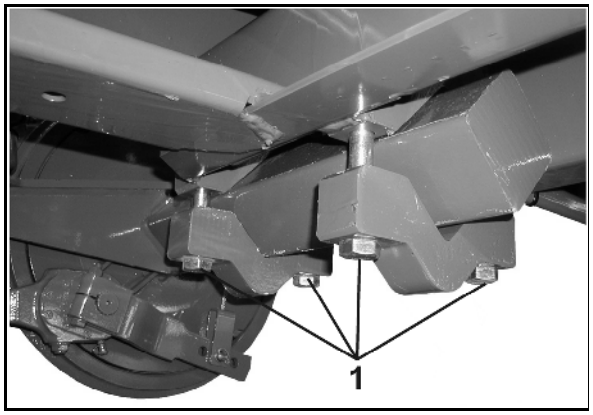


Fig. 128

4. Undo the clamping screws (Fig. 128/1).
5. Push in or pull out the axle halves to the desired position. Hereby determine dimension x from the outer edge of the base frame (Fig. 127/1) to the middle of the sprayer wheel and push in or pull out the axle halves respectively.
6. Tighten the clamping screws to a torque of 410 Nm with M 20 screws.
7. Push in or pull out the axle halves of the opposite side in the same manner.

Axle with brake system:

1. Hang the sprayer on the tractor.
2. Secure the tractor / implement against unintentional starting and rolling away.
3. Lift the sprayer on one side using a jack until the respective wheel lifts from the ground.
4. Undo the clamping screws (Fig. 129/1.2)..
5. Push in or pull out the axle halves to the desired position. Hereby determine dimension x from the outer edge of the base frame (Fig. 127/1) to the middle of the sprayer wheel and push in or pull out the axle halves respectively.
6. To align the axle, first tighten screws (Fig. 129/1) to a torque of 210 Nm.
7. Then tighten screws (Fig. 129/2) to a torque of 750 Nm.
8. Push in or pull out the axle halves of the opposite side in the same manner.

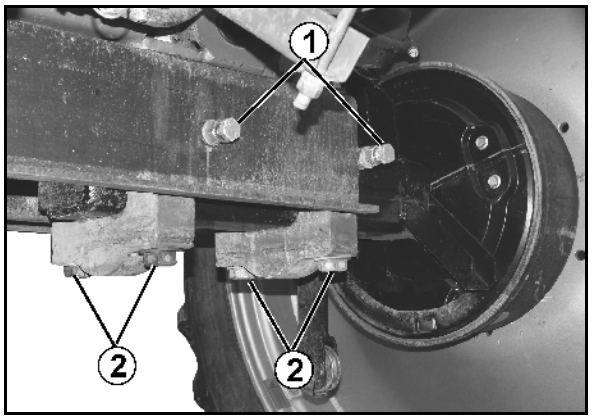


Fig. 129

8 Coupling and uncoupling the machine

When coupling and decoupling the machine, comply with the section "Safety information for the user", page 30.

WARNING

Risk of crushing from unintentional starting and rolling of the tractor and machine when coupling or uncoupling the machine.

When coupling or decoupling the machine, secure the tractor and machine against unintentional start-up and rolling before entering the danger area between the tractor and machine; refer to page 140.

WARNING

Risk of crushing between the rear of the tractor and the machine when coupling and uncoupling the machine.

Only actuate the operator controls for the tractor's three-point linkage

- from the intended workstation.
- if you are outside of the danger area between the tractor and the machine.

8.1 Coupling the machine

WARNING

Risk of breaking during operation, insufficient stability and insufficient tractor steering and braking power from improper use of the tractor.

You may only connect the machine to tractors suitable for this purpose. Refer to the section "Checking the suitability of the tractor", page 132.

WARNING

Risk of crushing when coupling the machine and standing between the tractor and the machine.

Instruct people to leave the danger area between the tractor and the machine before you approach the machine.

Any helpers may only act as guides standing next to the tractor and the machine, and may only move between the vehicles when both are at a standstill.

WARNING

Risk of crushing, being caught or pulled in, or impact when the machine is unexpectedly released from the tractor.

- Use the intended equipment to connect the tractor and the machine in the proper way.
- When coupling the machine to the tractor's three-point hydraulic system, ensure that the attachment categories of the tractor and the machine are the same.

  Be absolutely certain to upgrade the machine's category II lower link pin to category III using reducing sleeves if your tractor has a category III three-point linkage.
- Only use the upper and lower link pins provided to couple up the machine (original pins).
- Check the upper and lower link pins for visible defects whenever the machine is coupled. Replace the upper and lower link pins in the event of clearly visible wear.
- Secure the upper link pin and lower link pin in the attachment points of the three-point attachment frame against unintentional detachment using a linchpin.
- Perform a visual inspection to ensure that the upper and lower link hooks are correctly locked before reversing the tractor.

WARNING

Risk of energy supply failure between the tractor and the machine due to damaged power supply lines.

During coupling, check the course of the power supply lines. The power supply lines

- must give slightly to all movement of the connected machine without tensioning, kinking or rubbing.
- must not chafe against other parts.

1. Direct people away from the danger area between the tractor and machine before you approach the machine with the tractor.
2. Couple the supply lines first before coupling the machine with the tractor.
   - 2.1 Drive the tractor up to the machine, leaving a clearance of approximately 25 cm between tractor and machine.
   - 2.2 Secure the tractor against unintentional starting and unintentional rolling.
   - 2.3 Check whether the universal joint shaft of the tractor is switched off.
   - 2.4 Couple the PTO shaft and supply lines with the tractor.
   - 2.5 Hydraulic brake: fasten the parking brake pulling cable to the tractor.
3. Now reverse the tractor towards the machine so that the connection fitting can be coupled.
4. Couple the connection fitting.
5. Lift the stand into transport position.
6. Remove wheel chocks, release parking brake.

8.2 Uncoupling the machine

WARNING

Risk of crushing, cutting, being caught or drawn in, or impact through inadequate stability and tipping over of the uncoupled machine.

Park the empty machine on a horizontal space with a hard surface.

When uncoupling the machine, there must always be enough space in front of the machine so that you can align the tractor with the machine if necessary.

1. Park the empty machine on a horizontal space with a hard surface.
2. Uncouple the machine from the tractor.
   - 2.1 Secure the machine against unintentionally rolling. See page 140.
   - 2.1 Lower the stand to the parking position.
   - 2.2 **Un**couple the connection fitting.
   - 2.3 Draw the tractor forwards by approximately 25 cm.
   - → The space created between the tractor and the machine allows better access for decoupling the PTO shaft and the power supply lines.
   - 2.4 Secure the tractor and machine against unintentional starting and unintentional rolling.
   - 2.5 Decouple the PTO shaft.
   - 2.6 Place the PTO shaft in the holder.
   - 2.7 Uncouple the supply lines.
   - 2.8 Fasten the supply lines in the corresponding parking sockets.
   - 2.9 Hydraulic brake: detach parking brake pulling cable from tractor.

8.2.1 Manoeuvring the uncoupled machine

DANGER

You must be particularly careful when shunting the machine with the service brake system released, since only the manoeuvring vehicle is now braking the trailed sprayer.

The machine must be connected to the manoeuvring vehicle before you actuate the release valve on the trailer brake valve.

The manoeuvring vehicle must be braked.

The service brake system cannot be released using the release valve if the air pressure in the air reservoir drops below 3 bar (e.g. if the release valve has been actuated multiple times or if there are leaks in the brake system).

To release the service brake

- fill the air reservoir.
- Remove all air from the braking system at the drain valve on the air reservoir.

1. Connect the machine to the manoeuvring vehicle.
2. Brake the manoeuvring vehicle.
3. Remove the wheel chocks and release the parking brake.
4. **pneumatic braking system** only:

   4.1 Press the actuator button on the release valve as far as it will go (see page 70).

→ The service brake system is released and the machine can be manoeuvred.

   4.2 Once the manoeuvring procedure is finished, pull out the actuator button on the release valve as far as it will go.

→ The pressure from the air reservoir brakes the trailed sprayer again.

5. Actuate the brakes on the manoeuvring vehicle again once you have finished manoeuvring the machine.
6. Tighten the parking brake again and secure the machine against rolling with wheel chocks.
7. Uncouple the machine and manoeuvring vehicle.

9 Transportation

- During transportation, follow the instructions given in the section "Safety instructions for the operator", page 32.
- Before moving off, check:
  - that the supply lines are connected correctly.
  - the lighting system for damage, proper operation and cleanliness,
  - the braking and hydraulic systems for obvious defects.
  - that the parking brake is completely released
  - the function of the brake system

WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact when making interventions in the machine, through unintentional machine movements.

- On foldable machines, check that the transport locks are correctly locked.
- Secure the machine against unintentional movements before starting transportation.

WARNING

Risk of crushing, cutting, being caught and/or drawn in, or impact from tipping and insufficient stability.

- Drive in such a way that you always have full control over the tractor with the attached machine.

  In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the connected machine.

WARNING

Risk of breaking during operation, insufficient stability and insufficient tractor steering and braking power from improper use of the tractor.

These risks pose serious injuries or death.

Comply with the maximum load of the connected machine and the permissible axle and drawbar loads of the tractor. If necessary, drive only with a partially filled tank.

WARNING

Risk of falling when riding on the machine, contrary to instructions.

It is forbidden to ride on the machine and/or climb the machine while it is running.

Instruct people to leave the loading site before approaching the machine.

CAUTION

- During transportation, follow the instructions given in the section "Safety instructions for the operator", page 32.
- Transportation while Trail-Tron is switched on is prohibited.
- Transportation is prohibited with a locked tractor control unit. As a general rule, put the tractor control unit on the tractor into neutral for transportation.
- Use transport locking for locking the folded-in sprayer boom in its transport position to prevent it from folding out unintentionally
- Use the transport safety catch to secure the induction bowl when it has been swivelled up into its transport position to prevent it from swivelling down again accidentally.
- Use transport locking for locking the raised ladder to prevent it from folding down again accidentally.
- Securing elements engage the catching hooks and secure the ladder in the transport position against unintentional lowering.
- If a boom extension (option) is mounted, move it into the transport position.
- Switch the work lights off during transport to avoid blinding other motorists.

WARNING

Load-sensing operation:

Risk of accident through inadvertent activation of hydraulic functions during transport!

Close the stop tap on the load-sensing line.

DANGER

Move the steering drawbar/steering axle to the transport position for transportation.

Otherwise there is the risk of the machine tipping over!

10 Using the machine

When using the machine, observe the information in the following sections:

- "Warning symbols and other labels on the machine" starting on page 18 and
- "Safety information for the user", starting on page 30 ff.

Observing this information is important for your safety.

WARNING

Risk of breaking during operation, insufficient stability and insufficient tractor steering and braking power from improper use of the tractor.

Comply with the maximum load of the connected machine and the permissible axle and drawbar loads of the tractor. If necessary, drive only with a partially filled tank.

WARNING

Risk of crushing, cutting, being caught and/or drawn in, or impact through insufficient stability and tipping of the tractor and/or the attached machine.

Drive in such a way that you always have full control over the tractor, whether the machine is attached or unattached.

In so doing, take your personal abilities into account, as well as the road, traffic, visibility and weather conditions, the driving characteristics of the tractor and the connected machine.

WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact through

- **unintentional falling of raised, unsecured machine parts.**
- **unintentional start-up and rolling of the tractor-machine combination.**

Secure the tractor and the machine against unintentional start-up and rolling before eliminating faults on the machine. See page 140.

Wait for the machine to stop before entering the machine danger area.

WARNING

Danger for the operator or third parties from damaged components being ejected due to impermissibly high drive speeds of the tractor universal joint shaft.

Observe the permissible machine drive speed before switching on the tractor universal joint shaft.

WARNING

Risk of being caught and drawn in and danger from foreign objects being caught and thrown out in the danger area of the driven PTO shaft.

- Whenever the machine is used, first check to ensure that the safety devices and guards of the PTO shaft are fully intact and functional.

  Have damaged safety devices and guards of the PTO shaft replaced immediately by a specialist workshop.
- Check that the PTO shaft guard is secured against rotation by the supporting chain.
- Maintain a sufficient safety clearance between you and the driven PTO shaft.
- Direct people out of the danger area of the driven PTO shaft.
- Shut down the tractor engine immediately in case of danger.

WARNING

Risk of accidental contact with crop protection agents / spray liquid.

- Wear personal protective equipment
  - when preparing the spray liquid.
  - when cleaning / replacing the spraying nozzles during spraying operation.
  - for all cleaning work carried out on the field sprayer after spraying operation.
- When wearing the required protective clothing, always observe the manufacturer's instructions, the product information, the user manual, the safety datasheet or the operating manual for the crop protection agent to be used. For example, use:
  - Chemical-resistant gloves
  - Chemical-resistant overalls
  - Water-resistant footwear
  - A face mask
  - Breathing apparatus
  - Safety glasses
  - Skin protection agents, etc.

WARNING

Risk to health from accidental contact with crop protection agents or spray liquid.

- Put on protective gloves before
  - using crop protection agent,
  - carrying out work on a contaminated field sprayer or
  - cleaning the field sprayer.
- Wash the gloves with clear fresh water from the fresh water tank
  - immediately after contact with crop protection agent.
  - before removing the gloves.

- To use Trail-Tron, open the stop tap on the hydraulic cylinder.
- For load-sensing operation, open the stop tap on the load-sensing control line.

10.1 Preparing for spraying operation

- The field sprayer must be operating properly in order to guarantee correct application of the crop protection agent. Have the field sprayer tested regularly on a test rig. Rectify any deficiencies immediately.
- Make sure of using the correct filter equipment, see page 94
- Clean the field sprayer thoroughly before spreading a different crop protection agent.
- Flush the nozzle line before:
  - each time changing a nozzle.
  - before rotating the multiple-nozzle head to another nozzle.

  See the section on "Cleaning", page 187
- Fill the flushing water tank and the clear water tank.

10.2 Preparing the spray liquid

WARNING

Risk of accidental contact with crop protection agent and / or spray liquid.

- Always introduce the crop protection agent into the spray liquid tank using the induction bowl.
- Swivel the induction bowl into the filling position before pouring in the crop protection agent.
- Observe all safety regulations concerning physical protective equipment and breathing apparatus to be used when handling crop protection agents and preparing the spray liquid described in the instructions for use of the crop protection agent.
- Do not prepare the spray liquid in the vicinity of wells or surface water.
- Avoid leaks and contaminations involving crop protection agents and/or spray liquids by taking proper care and by wearing the appropriate physical protection equipment.
- To avert risks to third parties, do not leave any prepared spray liquid, unused crop protection agent, as well as used crop protection agent canisters and the used field sprayer unattended.
- Protect contaminated crop protection agent canisters and the contaminated field sprayer from precipitation.
- During and after preparing the spray liquid, provide for sufficient cleanliness to keep contamination risks as low as possible (e.g. thoroughly wash used gloves before removing them and dispose of the washing water and cleaning fluid in the proper manner).

- The prescribed water and agent spray rate can be found in the directions for use of the crop protection agent.
- Please read intently the directions for use of the agent and observe the specified precautions!

WARNING

Danger for people and animals from accidental contact with the spray liquid while filling the spray liquid tank!

- Wear personal protective equipment when handling crop protection agents or dumping spray liquids from the spray liquid tank. The type of personal protective equipment required is described in the manufacturer's instructions, the product information, the directions for use, the safety data sheet or the user manual for the crop protection agent in question.
- Never leave the field sprayer unattended while filling.
  - Never fill the spray liquid tank beyond the nominal volume.
  - When filling the spray liquid tank, never exceed the permissible load of the field sprayer. Pay attention to the respective specific weight of the liquid in question.
  - While filling, keep watch on the fill level indicator to avoid overfilling the spray liquid tank.
  - While filling the spray liquid tank, pay particular attention to the sealed surfaces; no spray liquid must be allowed to get into the sewerage system.
- Before each filling, check the field sprayer for damage, e.g. for leaking tanks and hoses, as well as for the correct positioning of all control elements.

While filling, pay attention to the permissible load capacity of your field sprayer. Always take the differing specific weights [kg/l] for the individual liquids into account while filling your field sprayer.

Specific weights of different liquids

Liquid	Water	Urea	UAN	NP solution
Density [kg/l]	1	1.11	1.28	1.38

AMATRON+:

Call up the fill indicator from the Work menu in the **AMATRON+**.

- As it is difficult to dispose of residues in an environmentally-friendly manner, carefully calculate the required filling quantity or refill quantity to avoid leaving any residue at the end of the spraying operation.
  - To calculate the required refill quantity for final filling of the spray liquid tank, use the "Filling table for remaining spray area". To do this, subtract the technical, undiluted residue in the sprayer boom from the calculated refill quantity!

    Refer to the section "Filling table for remaining areas".

Procedure

1. Determine the required water and agent spray rate by consulting the directions for use of the crop protection agent.
2. Calculate the filling quantity or refill quantity for the area to be treated.
3. Fill the machine and blend in the agent.
4. Agitate the spray liquid before commencing spraying operations in accordance with the instructions of the spraying agent manufacturer.

Fill the machine preferably using a suction hose and blend in the agent while filling.

The induction area is thereby flushed with water constantly.

- During the filling process, start blending in the agent once the tank filling level has reached more than 20%.
- When using more than one agent:
  - Clean the canister immediately after each induction of an agent.
  - Flush the induction port after each induction of an agent.

- When filling, no foam must escape from the spray liquid tank.

  The addition of a froth-inhibiting agent also prevents the spray liquid tank from frothing over.

The agitators normally remain switched on from the initial filling to the end of the spraying operation. The instructions of the agent manufacturer, however, have priority.

- With the agitator running, feed the water-soluble plastic film bag directly into the spray liquid tank.
- Before spraying, fully dissolve the urea by circulating the liquid. When dissolving large quantities of urea, the temperature of the spray liquid falls more sharply; the urea consequently dissolves more slowly. The warmer the water, the faster and more completely the urea can dissolve.

- Carefully wash the empty agent canisters, render them unusable, collect and dispose of them in a proper manner. Do not reuse them for other purposes.
- If only spray liquid is available for washing the agent canisters, first use this to carry out preliminary cleaning. Then wash them meticulously when clear fresh water is available, e.g. before preparing the next load for the spray liquid tank or when diluting the residue from the last load.
- Carefully wash out the empty agent tank (e.g. using canister flushing) and add the flushing water to the spray liquid!

10.2.1 Calculating the filling and refill quantity

To calculate the required refill quantity for the final filling of the spray liquid tank, use the "Filling table for remaining spray area", page 114.

Example 1:

The following are given factors:

Tank nominal volume	1000 l
Residue in the tank	0 l
Water consumption	400 l/ha
Agent required per ha	
Agent A	1.5 kg
Agent B	1.0 l

Question:

How many litres of water, how many kg of Agent A and how many litres of Agent B must be used to treat a surface of 2.5 ha in area?

Answer:

Water:	400 l/ha	x	2.5 ha	=	1000 l
Agent A:	1.5 kg/ha	x	2.5 ha	=	3.75 kg
Agent B:	1.0 l/ha	x	2.5 ha	=	2.5 l

Example 2:

The following are given factors:

Tank nominal volume	1000 l
Residue in the tank	200 l
Water consumption	500 l/ha
Recommended concentration	0.15 %

Question 1:

How many litres or kg of agent are needed to fill the tank?

Question 2:

How large is the area to be treated in ha if a residue of 20 l remains in the tank after spraying?

Formula and answer to Question 1:

$$\frac{\text{Refill amount of water [l] x concentration [\%]}}{100} = \text{Addition of agent [l or kg]}$$

$$\frac{(1000 - 200)\ [l] \times 0.15\ [\%]}{100} = 1.2\ [l \text{ or } kg]$$

Formula and answer to Question 2:

$$\frac{\text{Quantity of liquid available [l]} - \text{residue [l]}}{\text{Water consumption [l/ha]}} = \text{Area to be treated [ha]}$$

$$\frac{\text{1000 [l] (tank nominal volume)} - \text{20 [l] (residue)}}{\text{500 [l/ha] water consumption}} = \text{1.96 [ha]}$$

10.2.2 Filling table for remaining spray area

To calculate the required refill quantity for the final filling of the spray liquid tank, use the "Filling table for remaining spray area".

The specified refill quantities apply for a spray rate of 100 l/ha. For other spray rates, the refill quantity increases by a multiple.

Dis-tance	Working width [m]													
	15	16	18	20	21	24	27	28	30	32	33	36	39	40
[m]	**Refill quantity [l]**													
10	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**4**	**4**	**4**
20	**3**	**3**	**4**	**4**	**4**	**5**	**5**	**6**	**6**	**6**	**7**	**7**	**8**	**8**
30	**5**	**5**	**5**	**6**	**6**	**7**	**8**	**8**	**9**	**10**	**10**	**11**	**11**	**12**
40	**6**	**7**	**7**	**8**	**8**	**10**	**11**	**11**	**12**	**13**	**13**	**14**	**15**	**16**
50	**8**	**8**	**9**	**10**	**11**	**12**	**14**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
60	**9**	**10**	**11**	**12**	**13**	**14**	**16**	**17**	**18**	**19**	**20**	**22**	**23**	**24**
70	**11**	**11**	**13**	**14**	**15**	**17**	**19**	**20**	**21**	**22**	**23**	**25**	**27**	**28**
80	**12**	**13**	**14**	**16**	**17**	**19**	**22**	**22**	**24**	**26**	**26**	**29**	**30**	**32**
90	**14**	**15**	**16**	**18**	**19**	**22**	**24**	**25**	**27**	**29**	**30**	**32**	**34**	**36**
100	**15**	**16**	**18**	**20**	**21**	**24**	**27**	**28**	**30**	**32**	**33**	**36**	**38**	**40**
~~200~~	**30**	**32**	**36**	**40**	**42**	**48**	**54**	**56**	**60**	**64**	**66**	**72**	**74**	**80**
300	**45**	**48**	**54**	**60**	**63**	**72**	**81**	**84**	**90**	**96**	**99**	**108**	**114**	**120**
400	**60**	**64**	**72**	**80**	**84**	**96**	**108**	**112**	**120**	**128**	**132**	**144**	**152**	**160**
500	**75**	**80**	**90**	**100**	**105**	**120**	**135**	**140**	**150**	**160**	**165**	**180**	**190**	**200**

Fig. 131

10.2.3 Fill the spray liquid tank via the suction port and blend in the agent at the same time

Preferably perform the filling from a suitable container and not from an open water access point.

1. Connect the suction hose to the filling connection and water access point.
2. Move suction chest lever **G** to position .
3. Move the pressure gauge switch tap **A** to position .
4. Open switch tap **L**.
5. Set the setting tap main agitator **H** to the maximum position.

If the filling time is not enough for blending in the agent, the filling speed can be reduced by means of setting tap **H**, starting at a filling level of 500 l.

6. Activate the pump (at least 400 min^{-1}) and fill the tank.
7. Start blending in the agent when more than 20% of the tank filling level has been reached.

Blending in the agent:

(Blending in the agent via ECO-Fill, see page 164.)

8. Open the induction bowl lid.
9. Close switch tap **L**.
10. Move the pressure gauge switch tap **A** to position .
11. Open switch tap **D**
12. Move switch tap **E** to position .
13. Move switch tap **F** to position .

While blending in the agent, the supply of water and the suction speed can be adjusted using switch taps **E** and **F**.

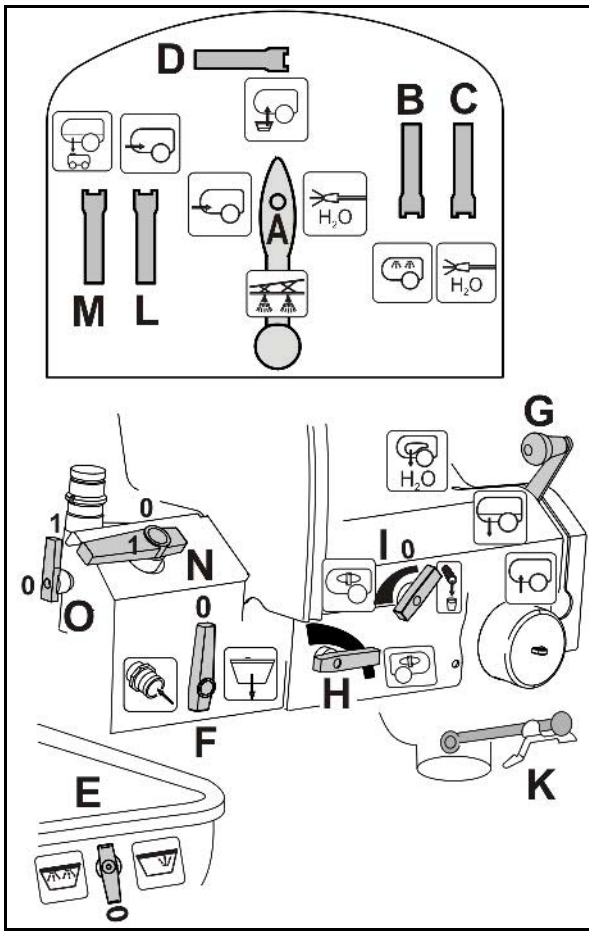


Fig. 132

14. Pour the quantity of agent calculated and measured for filling the tank into the induction bowl.

→ The content of the induction bowl is evacuated.

To increase the user's protection, for example when handling powder agents, first pour the agent into the induction bowl (maximum 50 l), close the lid, and only then

switch tap **F** to position and

switch tap **E** to position .

Rinse the canister:

15. Wash the canister or other containers using the canister flushing.
16. Move switch tap **E** to position .
17. Press the canister down for at least 30 secs.

→ The canister is rinsed with water.

18. Move switch tap **E** to position **0** and remove the canister.
19. Move switch tap **F** to position **0**.
20. Close switch tap **D**.

Once the tank has reached the set filling level:

21. Move switch tap **G** to position .
22. Decouple the suction hose from the filling connection.

→ The suction hose is still filled with water.

23. Set the setting tap main agitator **H** again to a medium position.

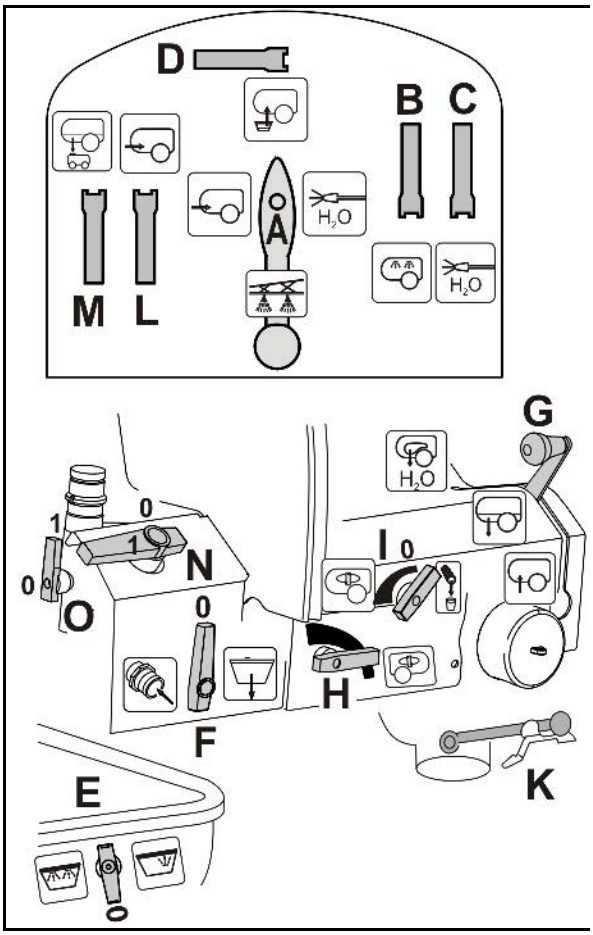


Fig. 133

Increasing the suction power by cutting in the injector:

Move switch tap **F** to position .

The injector is only to cut in at a filling level starting at 500 l.

Comfort equipment with filling stop:
The additional injector must not be switched on, as the automatic filling stop will not function otherwise.

The total suction power is 700 l/min.
(pumps 430 l/min., injector 270 l/min.).

Filling from open water access points

Follow regulations closely when filling the spray liquid tank from an open water access point with a suction hose.

10.2.4 Adding the agent using ECO-Fill

1. Activate the pump.
2. Couple the ECO-Fill container with ECO-Fill connection.
3. Move the pressure gauge switch tap **A** to position .
4. Move switch tap **D** to open.
5. Move switch tap **E** and **F** to position **0**.
6. Move switch tap **O** to position **1**.

→ Evacuate the ECO-Fill container.

7. Move switch tap **O** to position **0** when the desired quantity has been evacuated from the ECO-Fill container.

Rinsing the ECO-Fill counter:

1. Decouple the hose from the ECO-Fill container and couple it to the flushing foot.
2. Move switch tap **O** to position **1**.

→ The counter is flushed.

3. Move switch tap **O** and **D** back to 0 and disconnect the counter.

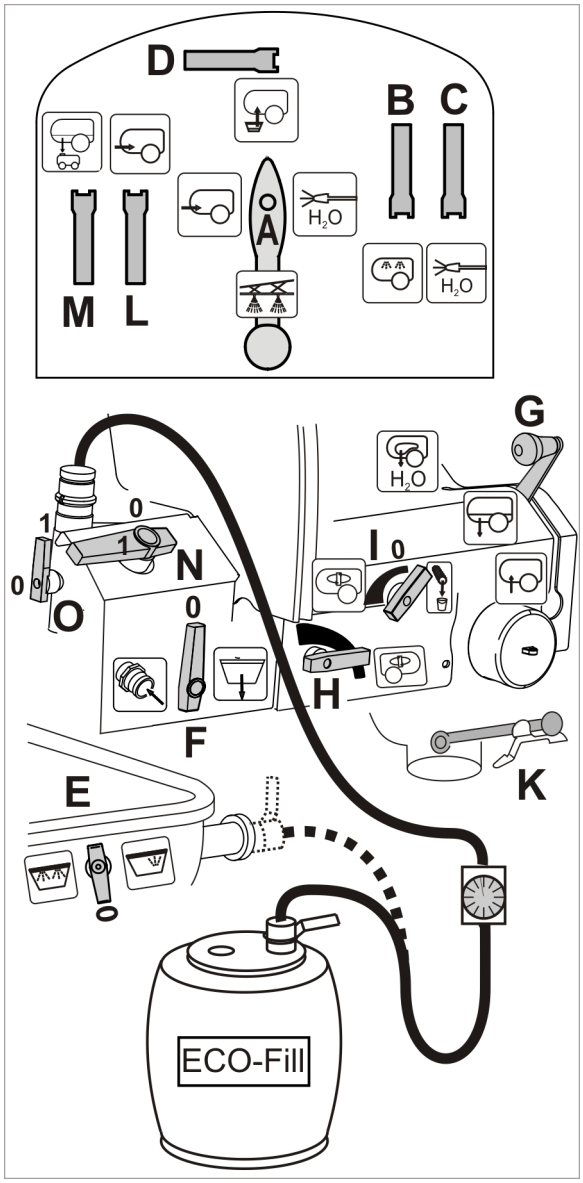


Fig. 134

10.2.5 Filling the spray liquid tank via the filling connection and blending in the agent

(option)

1. Connect the pressure line to the filling connection on the control terminal.
2. Move switch tap **N** to position **1**.
3. Start blending in the agent once 20% of the tank filling level has been reached.

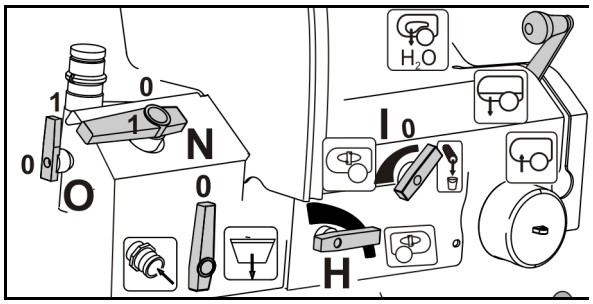


Fig. 135

Blending in the agents:

(Blending in the agent via ECO-Fill, see page 164.)

4. Activate the pump, set the pump speed to 400 rpm and set agitator **H** to a medium position.
   Where necessary, increase the agitating power for a more effective mixing.
5. Manually move suction chest **G** to position .
6. Move the pressure gauge switch tap **A** to position .
7. Open switch tap **D**
8. Open the induction bowl lid.
9. Move switch tap **E** to position .
10. Move switch tap **F** to position
    (The suction power can be adjusted between **0** and opened at maximum).

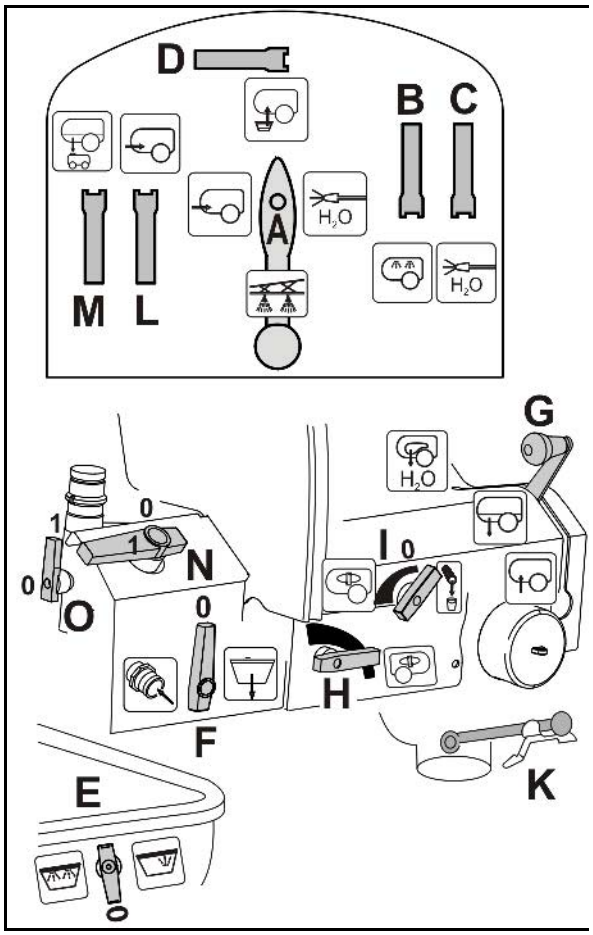


Fig. 136

> While blending in the agent, the supply of water and the suction speed can be adjusted using switch taps **E** and **F**.

11. Pour the calculated and measured quantity of agent for filling the tank into the induction bowl (maximum 50 l).

→ The content of the induction bowl is evacuated.

Rinse the canister:

12. Wash the canister or other containers using the canister flushing equipment.

    Move switch tap **E** to position .

13. Press the canister down for at least 30 secs.

→ The canister is washed with spray liquid.

> To flush a number of canisters, flush them with spray liquid immediately after they are emptied.
>
> Then wash all canisters with flushing water one after another.

14. Manually move suction chest **G** to position .

15. Close switch taps **D** and **H**.

16. Press the canister down for at least 30 secs.

→ **The canister is washed with flushing water.**

> If spray liquid was previously being used, it takes a little time before the flushing water reaches the nozzle.

17. Move switch tap **E** to position **0** and remove the canister.

18. Open switch tap **D**.

> Due to the high consumption of flushing water, keep switch tap **D** open only as long as necessary.

19. Move switch tap **F** to position .

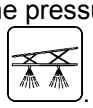
→ The content of the induction bowl is evacuated.

20. Move switch tap **E** to position .

→ The induction bowl is cleaned

21. Move switch taps **E** and **F** to position **0**.

22. Close switch tap **D** again.

23. Move the pressure gauge switch tap **A** to position  .

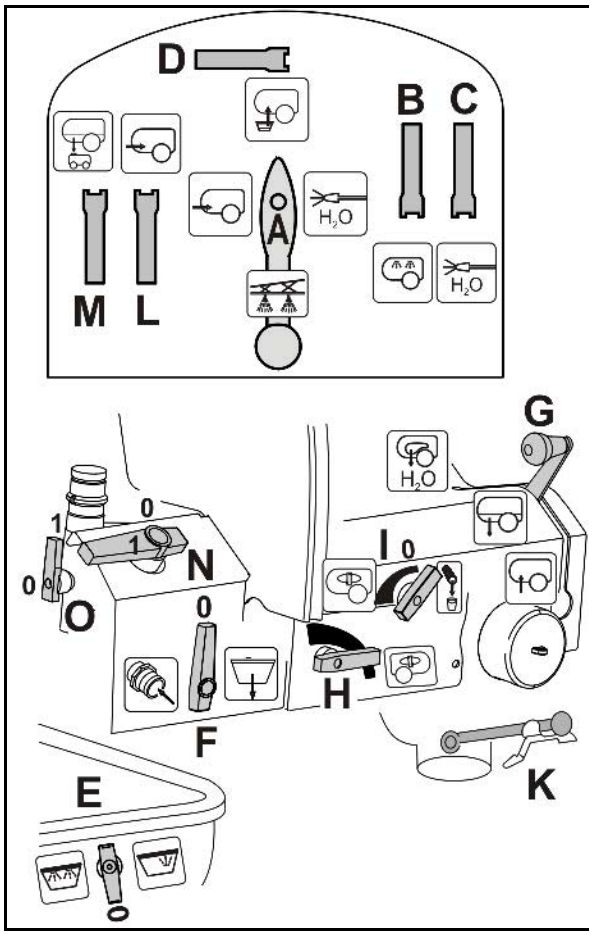


Fig. 137

In order to avoid overfilling, move switch tap **N** to position **0** when reaching 80% of the filling level at the latest.

→ This allows you to clean the canister with no hurry.

Complete filling the spray liquid tank:

24. Move switch tap **N** to position **0**.
25. Decouple the pressure line.

10.3 Spraying operation

Pay attention to the separate operating manual for the operating terminal.

Special instructions for spraying operations

- Test the field sprayer by carrying out a calibration:
  - before the start of the season
  - when there are deviations between the actual indicated spray pressure and the spray pressure prescribed in the spray table.
- Before starting to spray, determine the exact spray rate required, referring to the instructions of the crop protection agent manufacturer.

→ Before starting to spray, enter the required spray rate (target rate) in the AMATRON^{+} / AMASPRAY^{+}.

- During spraying operations, adhere exactly to the required spray rate [l/ha]:
  - in order to achieve the best possible results from your measure to protect your crop
  - to avoid unnecessary pollution of the environment.
- Select the required nozzle type from the spray table before starting to spray, taking into account:
  - the prescribed operational speed,
  - the required spray rate and
  - the required atomisation characteristic (fine, medium or coarse-dropped) of the crop protection agent used in the crop protection measure.

  Refer to the section "Spray tables for flat-fan, anti-drift, injector and air-mix nozzles", page on page 179.
- Select the required nozzle size from the spray table before starting to spray, taking into account:
  - the prescribed operational speed,
  - the required spray rate and
  - the targeted spray pressure.

  Refer to the section "Spray tables for flat-fan, anti-drift, injector and air-mix nozzles", page on page 179.
- Select a low operational speed and a low spray pressure to prevent wastage from windward drift!

  Refer to the section "Spray tables for flat-fan, anti-drift, injector and air-mix nozzles", on page 179.
- At wind speeds of 3 m/s, take additional drift reduction measures (refer to the section "Measures for drift reduction", page 172)!

- Refrain from use if the average wind speed tops 5 m/s (leaves and thin twigs move).
- To avoid overdosing, switch the sprayer boom on and off only while travelling.
- Avoid overdosing through overlapping, caused by imprecise bout tracking from one spray path to the next and/or when cornering on the headlands with the sprayer boom switched on!
- When increasing operational speed, make sure that the maximum permissible pump drive speed of 550 rpm is not exceeded!
- During spraying operations, constantly check the actual spray liquid consumption in relation to the area treated.
- Calibrate the flow meter if there are any differences between the actual spray rate and displayed spray rate.
- Calibrate the distance sensor (impulses per 100 m) if there are differences between the actual distance covered and the distance displayed.
  See **AMATRON+ / AMASPRAY+** operating manual.
- If spraying operations must be interrupted because of bad weather, by all means clean the suction filter, the pump, the valve chest and the spray lines. See page **177**.

- Spray pressure and nozzle size influence the droplet size and the volume of liquid sprayed. The higher the spray pressure, the smaller the droplet diameter of the spray liquid. The smaller droplets are more easily subject to increased, undesirable drifting!
- If the spray pressure is increased, the spray rate also increases.
- If the spray pressure is decreased, the spray rate also decreases.
- If the operational speed is increased while the nozzle size and spray pressure remain constant, the spray rate decreases.
- If the operational speed is decreased while the nozzle size and the spray pressure remain constant, the spray rate increases.
- Operational speed and pump drive speed can be selected within broad limits, owing to the automatic, area-based spray rate control via the **AMATRON+ / AMASPRAY+**.

- The pump delivery capacity is dependent on the pump drive speed. Select a pump speed (between 400 and 550 rpm.) that always allows for an adequate flow rate to the sprayer boom and the agitator. When selecting, always take into account that more spray liquid needs to be conveyed at higher operational speeds and higher spray rates.
- The agitator normally remains switched on from the filling stage until the end of spraying operations. The instructions of the agent manufacturer, however, have priority.
- The spray liquid tank is empty when the spray pressure abruptly falls considerably.
- Residues in the spray liquid tank can be applied correctly up to a pressure drop of 25%.
- If the spray pressure drops off while conditions remain otherwise unaltered, the suction or pressure filter are probably blocked.

10.3.1 Applying the spray liquid

- Properly couple the field sprayer to the tractor!
- Before starting to spray, check the following machine data on the operating terminal:
  - o the values for the permitted spray pressure range of the spraying nozzles installed in the sprayer boom
  - o the value "impulses per 100 m"
- Take the appropriate measures if, during spraying operations, a fault message appears on the display.
- Check the displayed spraying pressure during spraying operations.

  Make sure that the spray pressure displayed does not, under any circumstances, deviate by more than ± 25 % from the target spray pressure given in the spray table by changing, for example, the spray rate using the plus / minus buttons. Larger deviations than this from the target spray pressure make it impossible to achieve the best possible results from your crop protection measure and lead to pollution of the environment.

  Decrease or increase the operational speed until you are back within the permissible spray pressure range for the target spray pressure.

Example:

Required spray rate:	200 l/ha
Intended operational speed:	8 km/h
Nozzle type:	LU/XR
Nozzle size:	'05'
Permissible pressure range for the installed spraying nozzles:	min. pressure 1 bar max. pressure 5 bar
Target spray pressure:	3.7 bar
Permissible spray pressure: 3.7 bar ± 25 %	min. 2.8 bar and max. 4.6 bar

1. Prepare and stir the spray liquid correctly in accordance with the instructions from the crop protection agent manufacturer.
2. Manually move suction chest **G** to position .
3. Move the pressure gauge switch tap **A** to position .
4. Switch on agitator **H**, **I**.
   The agitator power can be set variably.
5. Switch on the operating terminal.
6. Unfold the sprayer boom.
7. Depending on the nozzles being used, set the working height of the sprayer boom (gap between the nozzles and the crop) according to the spray table.
8. Enter the value for the required spray rate into the operating terminal.
9. Activate pump at the pump operating speed.

> At low spray rates, the pump speed can be reduced to save energy.

10. Switch on the sprayers via the operating terminal.

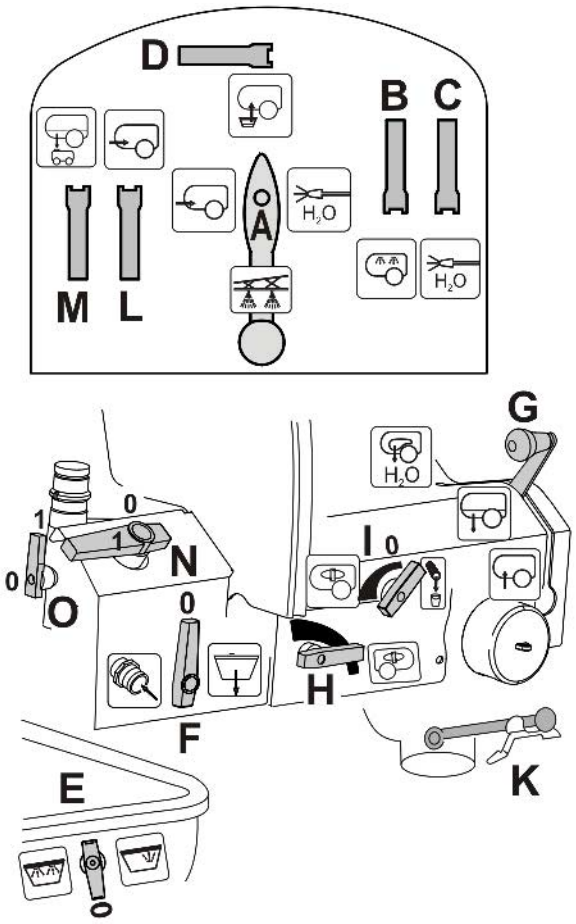


Fig. 138

Driving to the field with the agitator switched on

1. Switch off the operating terminal.
2. Switch off the pump drive.
3. Set the desired agitating intensity.

10.3.2 Drift reduction measures

- Reschedule treatment for the early morning or the evening hours (there is generally less wind).
- Choose larger nozzles and a higher water spray rate.
- Reduce spray pressure.
- Precisely maintain the working height of the boom, because the risk of drifting rises very sharply as the distance between the nozzles increases.
- Reduce operational speed (to below 8 km/h).
- Use so-called anti-drift (AD) nozzles or injector (ID) nozzles (nozzles which produce a high proportion of coarse drops).
- Observe the distance requirements of the respective crop protection agent.

10.3.3 Dilute the spray liquid with flushing water

1. Activate the pump, adjust pump speed to 450 rpm.
2. Manually move suction chest **G** to position

.
3. Move the pressure gauge switch tap **A** to position .
4. Close main agitator **H**.
5. Control the flushing water supply using the auxiliary agitator **I**.

Once the desired amount of flushing water has been supplied:

6. Manually move suction chest **G** to position .

10.4 Residues

There are three types of residue:

- excessive residue remaining in the spray liquid tank when the spraying operation is finished

→ This excessive residue is discharged diluted or pumped-out and disposed of.

- the technical residue that remains in the spray liquid tank, the suction chest and the spray line when the spray pressure drops off by 25%

  The suction chest is composed of the suction filter, pump and pressure controller sub-assemblies. Observe the values for the technical residues given on page 114.

→ This technical residue is discharged diluted onto the field while cleaning the field sprayer.

- The final residue that remains in the spray liquid tank, the suction chest and the spray line after being cleaned with air discharge from the nozzles.

→ This final diluted residue is drained off after cleaning.

Disposing of the residues

- Make sure that the residue in the spray line continues to be sprayed in an undiluted concentration. Always spray this residue on an untreated area. The distance needed to use up this undiluted residue can be found in the section "Technical Data - spray lines", page 114. The residue contained in the spray line is dependent on the sprayer boom working width.
- Switch on the agitator for spraying the spray liquid tank empty when the residue in the spray liquid tank is only 5% of the nominal volume. With the agitator switched on, the technical residue increases in comparison to the specified values.
- Measures intended for the user's protection apply when emptying residues. Observe the instructions from the crop protection agent manufacturer and wear appropriate protective clothing.

10.4.1 Diluting the excess residue in the spray liquid tank and spraying out the diluted residue remaining at the end of spraying operations

For machines with comfort equipment, see the operating manual for **AMATRON+**.

1. Switch the sprayer off on the on-board computer.
2. Activate pump at the pump operating speed.
3. Manually move suction chest **G** to position

.

→ Dilute the excess residue with the tenfold amount of flushing water.

4. Control the flushing water supply using agitator **H**.
5. Once the desired filling level has been reached:

   Manually move suction chest **G** to position
.

6. Move agitator **H, I** to position **0**.
7. Switch on the sprayers on the on-board computer.

→ Where possible, first spray the undiluted spray liquid out of the spray line onto a remaining untreated area.

→ Spray the excess residue onto the already treated area.

→ Keep spreading the diluted residues until only air comes out of the nozzles.

8. Switch off the sprayers on the on-board computer.
9. Clean the field sprayer.

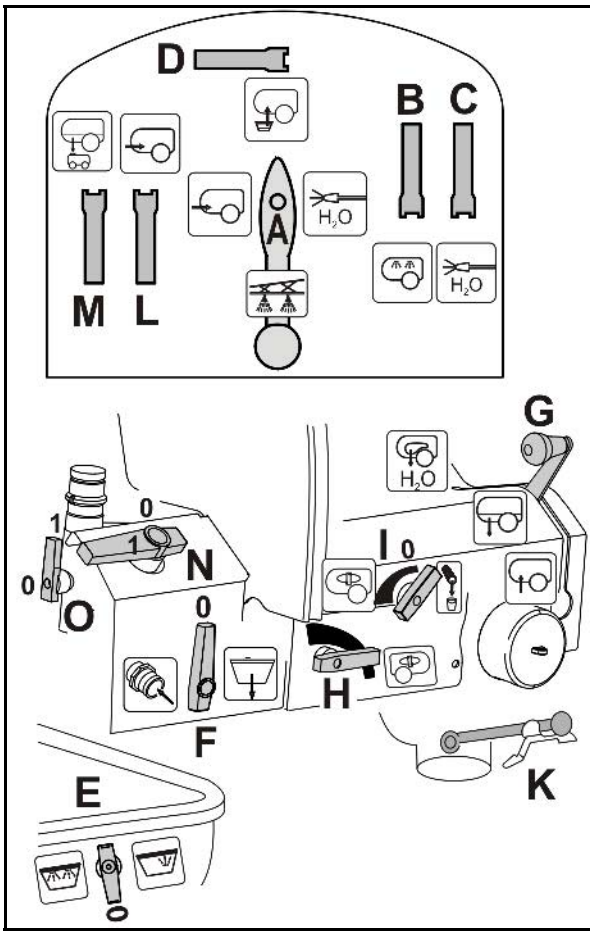
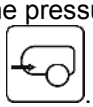


Fig. 139

When spreading residues on already treated areas, observe the maximum permissible spray rate of the agents.

10.4.2 Emptying the spray liquid tank using the pump

1. Connect a suitable drainage hose to the drainage connection on the machine side using a 2 inch Cam Lock Coupling.
2. Move the pressure gauge switch tap **A** to position  .
3. Open switch tap **M**.
4. Move suction chest lever **G** to position .
5. Switch off the main agitator **H**.
6. Activate the pump (540 rpm).

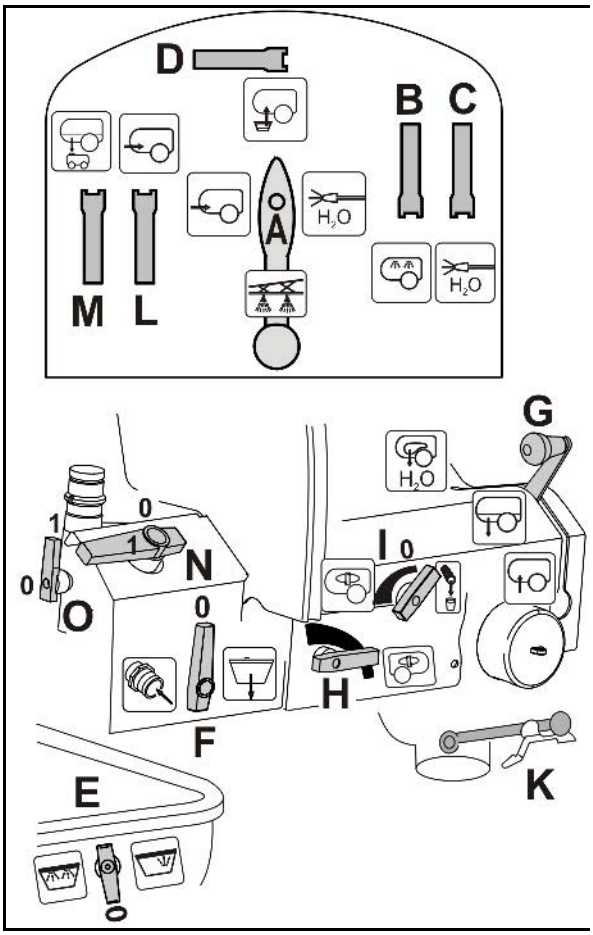


Fig. 140

10.5 Cleaning the field sprayer

- Keep the exposure time as short as possible, for example by daily cleaning of the utensils after the spraying operation is completed. Do not leave the spray liquid in the spray liquid tank for an excessively long period, e.g. overnight.

  The service life and reliability of the field sprayer mainly depend on how long the materials of the field sprayer are exposed to the crop protection agent.
- Clean the field sprayer thoroughly before applying a different crop protection agent.
- Carry out the cleaning process on the field where you last carried out the treatment.
- Carry out the cleaning process using water from the flushing water tank.
- You can carry out the cleaning process in the courtyard if you have a collecting facility installed (e.g. a Biobed).

  Observe all national regulations involved.
- When spreading residues on areas already treated, observe the maximum permissible spray rate of the agents.

For machines with comfort equipment, see the operating manual for **AMATRON+**.

10.5.1 Cleaning the sprayer with the tank empty

- Clean the spray liquid tank on a daily basis!
- The flushing water tank must be filled completely.
- The cleaning process should be carried out in a threefold reduction procedure.

1. Activate the pump, adjust pump speed to 450 rpm.
2. Manually move suction chest **G** to position H_2O.
3. Move the pressure gauge switch tap **A** to position .
4. Open the agitator(s) **H, I** completely.

→ Flush the agitator with 10% of the flushing water supply.

5. Switch off agitator(s) **H, I**.

DUS: Spray lines are flushed automatically. Use 10 % of the flushing water supply for this purpose.

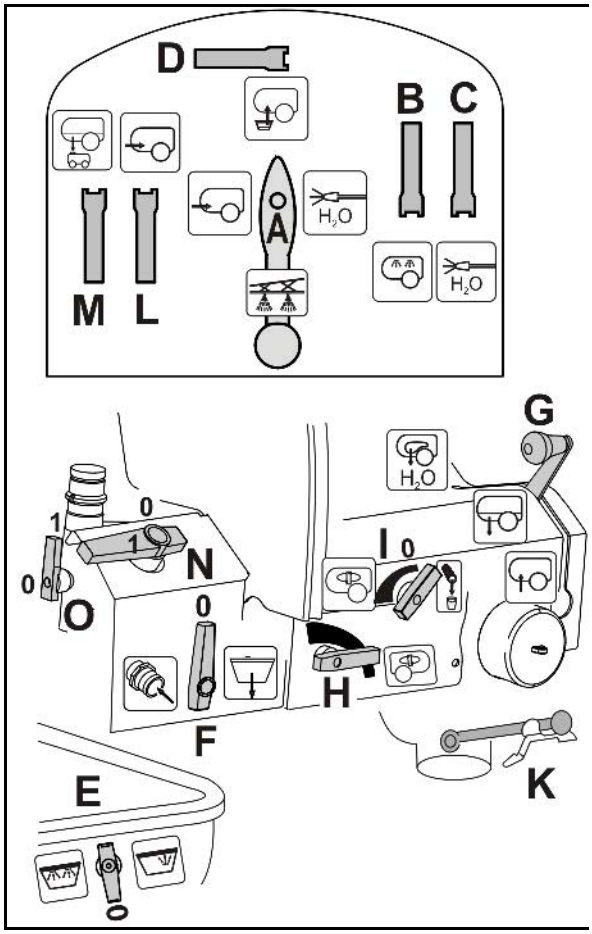
6. Move the pressure gauge switch tap **A** to position H_2O.
7. Open switch tap **B**.

→ Carry out the internal cleaning with 10% of the flushing water supply.

8. Close switch tap **B**.
9. Manually move suction chest **G** to position .
10. Move the pressure gauge switch tap **A** to position .
11. Spread the diluted residues on the area already treated while driving.
12. Switch the sprayer off and back on again several times for a few seconds via the onboard computer.

The valves and the return lines are flushed by this switching on and off.

→ Keep spreading the diluted residues until only air comes out of the nozzles.



Repeat the procedure three times.

Third run:

- Flushing the DUS and agitator is not necessary on the third run.
- Use the rest of the flushing water supply for the internal cleaning.

13. Drain the final residue, see page 178.
14. Clean the suction filter and pressure filter, see page 179, 179.

10.5.2 Draining the final residues

- On the field: Spread the final residues over the field.
- In the courtyard:
  - Place a suitable collecting container under the drain opening of the suction chest and the drain hose for the pressure filter and collect the final residues.
  - Dispose of the collected spray liquid residue in accordance with the corresponding legal guidelines.
  - Collect the spray liquid residues in suitable containers.

1. Switch off the pump.
2. Manually move suction chest **G** to position .
3. Move switch tap **I** to position .
4. Open stop tap **K**.

→ Drain the technical residue.

5. Close switch tap **K** again and move switch tap **I** to position **0**.

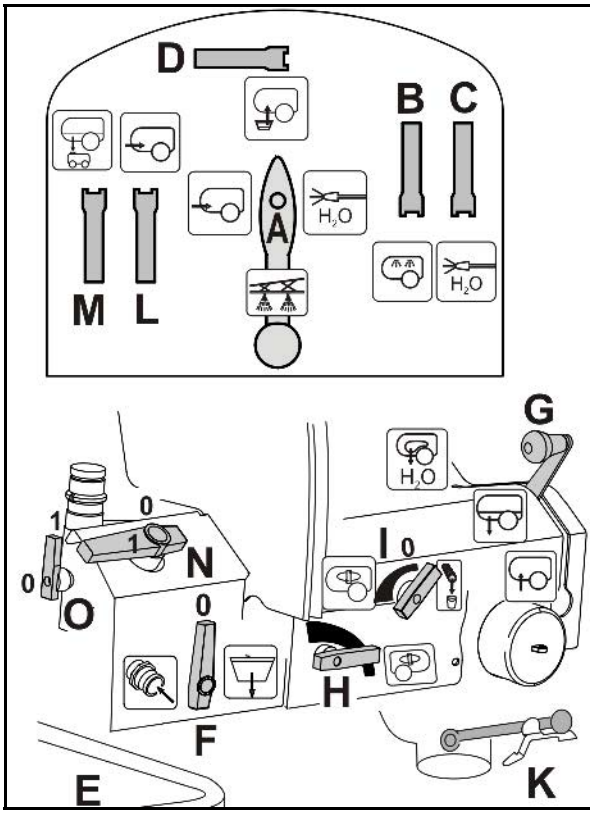


Fig. 141

10.5.3 Cleaning the suction filter when tank is empty

Clean the suction filter (Fig. 142) on a daily basis after cleaning the field sprayer.

1. Unscrew the cover of the suction filter (Fig. 142/2).
2. Remove the cover with suction filter (Fig. 142/3) and clean with water.
3. Reassemble the suction filter in the reverse sequence.
4. Check the filter housing for leaks.

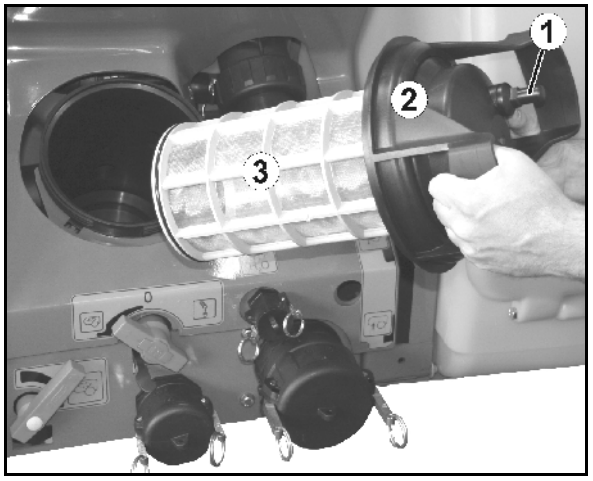
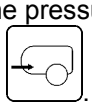


Fig. 142

10.5.4 Cleaning the suction filter when tank is full

1. Activate the pump, adjust pump speed to 300 rpm.
2. Manually move suction chest **G** to position .
   Attention: The Cam Lock Coupling must be mounted on the suction port.
3. Move the pressure gauge switch tap **A** to position  .
4. Open switch tap **L**.
5. Open agitator **H** completely.
6. Unscrew the cover of the suction filter (Fig. 142/2).
7. Activate the relief valve on the suction filter (Fig. 142/1).
8. Remove the cover with suction filter (Fig. 142/3) and clean with water.
9. Reassemble the suction filter in the reverse sequence.
10. Check the filter cover for leaks.

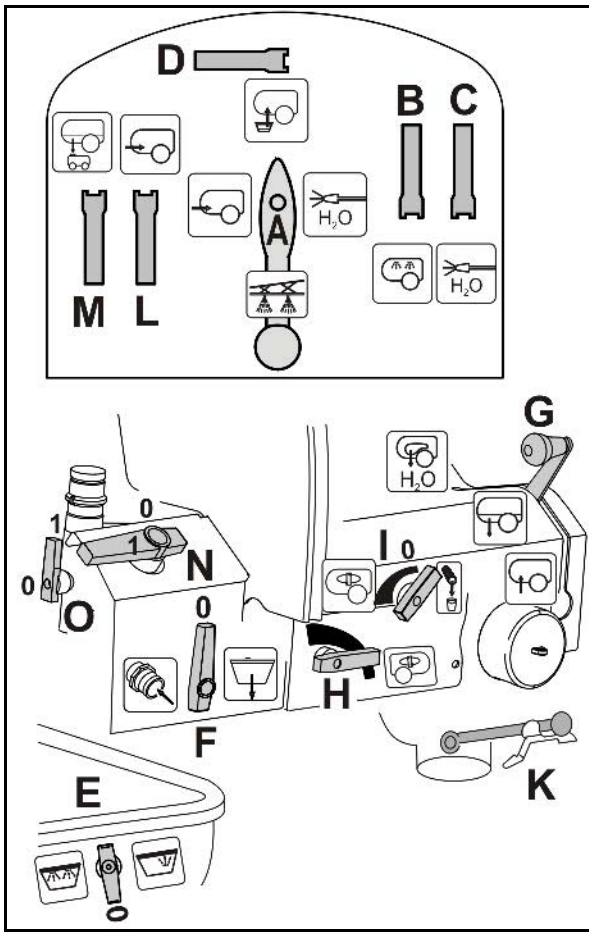


Fig. 143

10.5.5 Cleaning the pressure filter when the tank is empty

1. Undo the sleeve nuts.
2. Remove the pressure filter (Fig. 144/1) and clean with water.
3. Refill the pressure filter.
4. Check the screw connection for leaks.

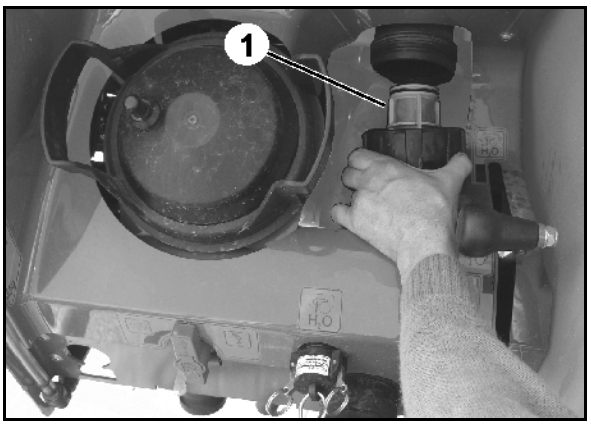


Fig. 144

10.5.6 Cleaning the pressure filter when the tank is full

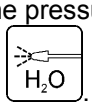
1. Manually move suction chest **G** to position .
2. Move switch tap **I** to position .

→ Drain the residue into the pressure filter.

1. Undo the sleeve nuts.
2. Remove the pressure filter (Fig. 144/1) and clean with water.
3. Refill the pressure filter.
4. Check the screw connection for leaks.
5. Move switch tap **I** to position **0**.

10.5.7 Exterior cleaning

1. Move suction chest lever **G** to position

.
2. Move the pressure gauge switch tap **A** to position 

.
3. In case no internal cleaning has been previously done:

   Open the switch tap **B** for 30 seconds until flushing water runs out of the nozzles.
4. Open switch tap **C**.
5. Activate the pump.
6. Clean the field sprayer and the sprayer boom with the spray gun.

Following the external cleaning:

7. Close switch tap **C** and
8. Move the pressure gauge switch tap **A** to position
.

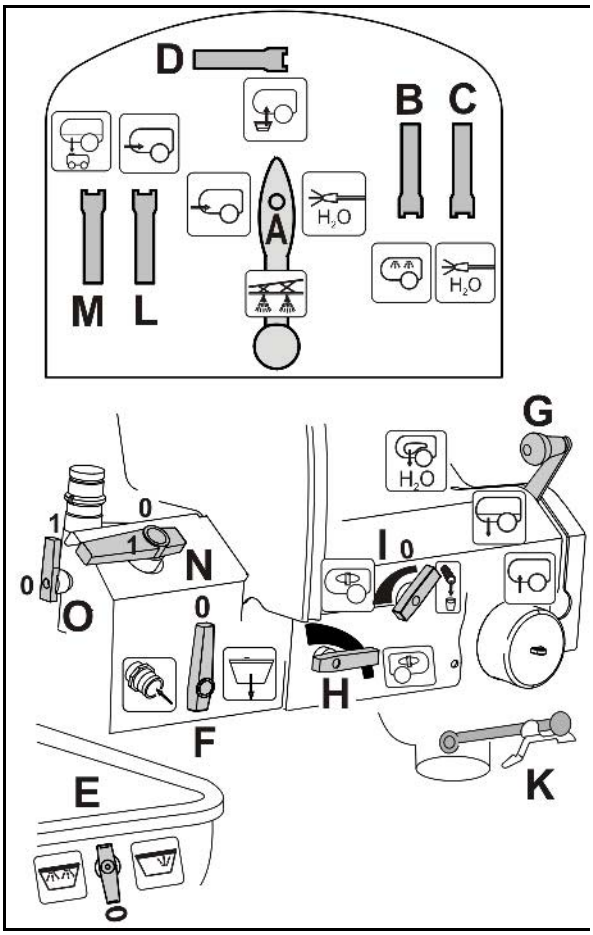


Fig. 145

10.5.8 Cleaning the sprayer during a critical agent change

1. Clean the sprayer in three runs as always, see page 177
2. Fill up the flushing water tank.
3. Clean the sprayer, two runs, see page 177.
4. If the sprayer has been previously filled via the pressure connector:

   Clean the induction bowl using the spray pistol and extract the content of the induction bowl.
5. Drain the final residue, see page 178.
6. By all means, clean the suction filter and pressure filter, see page 179, 179.
7. Clean the sprayer, one run, see page 177.
8. Drain the final residue, see page 178

10.5.9 Cleaning the sprayer with a full tank (work interruption)

If spraying operations must be interrupted because of bad weather, by all means clean the suction chest (suction filter, pumps, pressure controller) and the spray line.

1. Interrupt pump operation.
2. Switch off agitator(s) **H, I**.
3. Manually move suction chest **G** to position H_2O.
4. Activate the pump, adjust pump speed to 450 rpm.

Without nozzle control:

5. Spread at least 50 litres of flushing water over an untreated area while driving.

→ The sprayer is cleaned with flushing water.

- **Tank, agitators are not clean!**
- **The spray liquid concentration in the tank is unchanged.**

With nozzle control:

→ The sprayer is cleaned with flushing water. This is done using two litres of flushing water per metre of working width (observe the filling level).

6. Switch on the sprayers for a short period.

→ The nozzles are flushed.

7. Switch the pump off immediately because the agent concentration drops.

- **Tank, agitators are not clean!**
- **The spray liquid concentration in the tank has changed.**

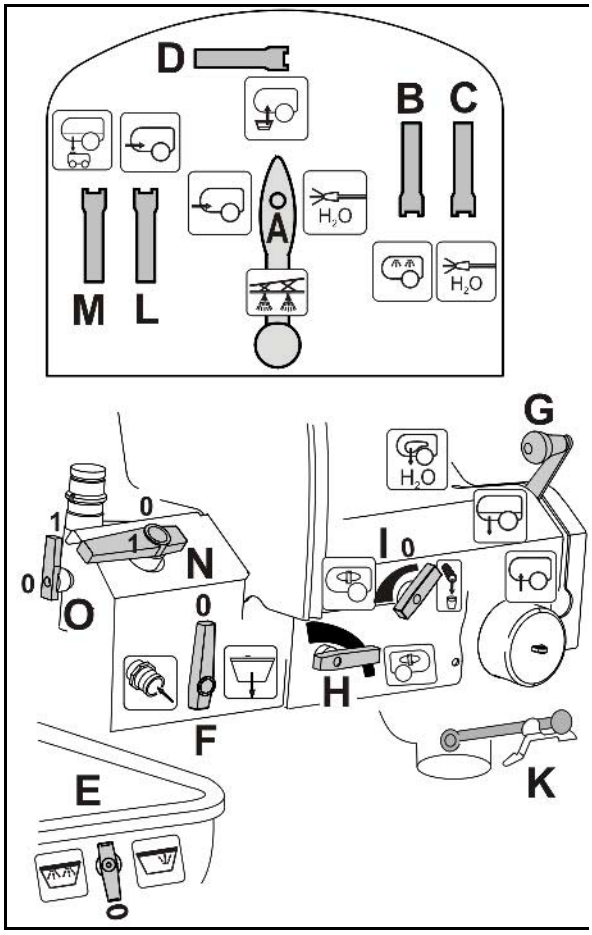


Fig. 146

Continuing the spraying operation

Before continuing with the spraying operation, activate the pump for five minutes at 540 min^{-1} and switch on the agitators completely.

11 Faults

WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact through

- **unintentional falling of the machine raised using the tractor's three-point linkage.**
- **unintentional falling of raised, unsecured machine parts.**
- **unintentional start-up and rolling of the tractor-machine combination.**

Secure the tractor and the machine against unintentional start-up and rolling before eliminating faults on the machine. See page 140.

Wait for the machine to stop before entering the machine danger area.

Fault	Cause	Remedy
There is no suction from the pump	Blockage on the suction side (suction filter, filter insert, suction hose).	Remove the blockage.
	Pump is sucking in air.	Check the hose connection of the suction hose (optional) on the suction port for leak tightness.
The pump does not have any power	Suction filter and filter insert dirty.	Clean suction filter and filter insert.
	The valves are jammed or damaged.	Change the valves.
	Pump is sucking in air, recognisable from the air bubbles in the spray liquid tank.	Check the hose connections on the suction hose for leak tightness.
The spray cone vibrates	Irregular delivery flow from the pump.	Check, and if necessary replace, the suction and pressure-side valves (see on page 213).
Oil/spray liquid mixture in the oil filler neck or clearly visible consumption of the oil	Pump diaphragm defective.	Change all six piston diaphragms (see 214).
The required spray rate entered is not achieved	High operational speed; low pump drive speed;	Reduce the operational speed and increase the pump drive speed until the fault message disappears and the audible alarm signal stops
There has been a deviation from the permissible spray pressure range for the nozzle fitted to the sprayer boom	Deviation from the prescribed operational speed, which has an effect on the spray pressure	Alter your operational speed to return to the prescribed operational speed range set for spraying operation

12 Cleaning, maintenance and repair

WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact through

- **unintentional falling of the machine raised using the tractor's three-point linkage.**
- **unintentional falling of raised, unsecured machine parts.**
- **unintentional start-up and rolling of the tractor-machine combination.**

Secure the tractor and machine against unintentional start-up and rolling, before carrying out cleaning, maintenance or repair work on the machine; see page 140.

WARNING

Risk of crushing, shearing, cutting, being caught and/or drawn in, or impact through unprotected danger points.

- Mount protective equipment removed when cleaning, maintaining and repairing the machine.
- Replace defective protective equipment with new equipment.

DANGER

- **When carrying out maintenance and repair, observe the safety instructions, particularly "Field sprayer operation" section, on page 38.**
- **You may only carry out maintenance or repair work under moving machine parts that are in a raised position if such parts are secured with suitable, positive-fit locking devices against accidental lowering.**

Before each start-up

1. Check hoses/tubes and connection pieces for any visually obvious defects/leaking connections.
2. Repair any areas of chafing on hoses and pipes.
3. Immediately replace worn or damaged hoses and pipes.
4. Immediately repair leaking connections.

- Regular and proper maintenance will keep your trailed sprayer in good condition for a long time, and will prevent early signs of wear. Regular and proper maintenance is a requirement of our warranty conditions.
- Use only genuine **AMAZONE** spare parts (see "Spare and wear parts and aids" section, page 17).
- Use only genuine **AMAZONE** replacement hoses, and hose clamps made of V2A for assembly.
- Specialist knowledge is the requirement for carrying out testing and maintenance operations. This specialist knowledge is not given here in this operating manual.
- Observe environmental protection measures when carrying out cleaning and maintenance work.
- Observe legal requirements when disposing of lubricants, e.g. oils and grease. Also affected by these legal requirements are parts that come into contact with these lubricants.
- Do not exceed a greasing pressure of 400 bar when greasing with high pressure grease guns.
- The following are prohibited:
  - drilling the running gear.
  - drilling through pre-existing holes on the transport frame.
  - welding load-bearing components.
- Protective measures are necessary, such as covering lines or extending lines in particularly critical locations
  - during welding, drilling and grinding work.
  - when working with cut-off wheels near plastic wires and electric wires.
- Clean the field sprayer thoroughly with water before carrying out repair work.
- Carry out repair work on the field sprayer with the pump switched off.
- Thorough cleaning must be carried out before repair work can be carried out inside the spray liquid tank. Keep out of the spray liquid tank.
- Disconnect the machine cable and power supply from the on-board computer when carrying out any cleaning or maintenance work. This applies especially to welding on the machine.

12.1 Cleaning

- Monitor brake, air and hydraulic hose lines particularly carefully
- Never treat brake, air or hydraulic hose lines with benzin, benzene, petroleum or mineral oils.
- Lubricate the trailed sprayer after cleaning, particularly after cleaning with a pressure washer / steam jet, or fat-soluble mediums.
- Observe the statutory requirements for the handling and removal of cleaning agents.

Cleaning with a pressure washer / steam jet

- Always observe the following points when using a pressure washer / steam jet for cleaning:
  - Do not clean any electrical components.
  - Do not clean any chromed components.
  - Never aim the cleaning jet from the cleaning nozzle of the pressure washer / steam jet directly on lubrication and bearing points.
  - Always maintain a minimum jet distance of 300 mm between the pressure washer or steam jet cleaning nozzle and the machine.
  - Comply with safety regulations when working with pressure washers.

12.2 Winter storage and long periods out of operation

1. Clean the field sprayer thoroughly before placing it in winter storage;
2. Run the pumps at a universal joint shaft speed of 300 rpm and let it "pump dry" when flushing is complete and liquid is no longer coming out of the spraying nozzles.
3. Open stop tap **K**, drain the technical residue from the suction side, change several times between the various positions on the suction chest **G**, and close stop tap **K** again.
4. Move switch tap **I** to position , drain the technical residue from the pressure side, change several times between the various positions on the pressure equipment switch tap **A**, and move switch tap **I** back to position **0**.
5. For each sprayer boom part width section, remove a diaphragm valve from a nozzle body, so that the nozzle lines run empty.
6. Switch off universal joint shaft if no more liquid is coming out of the nozzle lines, after several changes of position on the suction chest and pressure equipment.
7. Clean the suction filter;
8. Remove the pump pressure hose so that the remaining water can flow out of the pressure hose and pressure equipment.
9. Once more, change between all positions of the pressure equipment.
10. Switch the universal joint shaft back on and run the pump for approx. ½ a minute until liquid is no longer coming out of the pressure-side connection.
11. Reattach the pressure hose.
12. Lubricate the universal joints on the PTO shaft and, for longer periods out of operation, grease the section tube.
13. Before winter storage, change the oil in the pumps.
14. Drain the hoses on the induction bowl and injector.

- At temperatures below freezing, hand crank the piston diaphragm pumps before starting to prevent residual ice from damaging the piston and piston diaphragm.
- Store the pressure gauge and any other electronic accessories in a place where they are safe from frost.

Emptying the flushing water tank

1. Remove the screw lid from the emptying opening under the flushing water tank and drain off the flushing water.
2. Then screw the cover plate back on again.

12.3 Lubrication specifications

Lubricate all grease nipples (keep gaskets clean).

Lubricate / grease the machine at the specified intervals.

Lubrication points on the machine are indicated with the foil (Fig. 147).

Carefully clean the lubrication points and grease gun before lubrication so that no dirt is pressed into the bearings. Press the dirty grease out of the bearings completely and replace it with new grease.

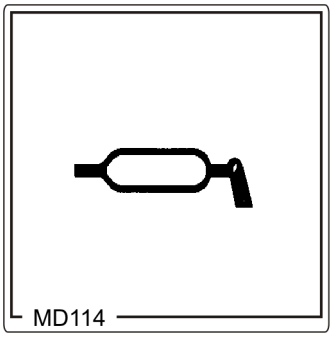


Fig. 147

Lubricants

For lubrication, use a lithium saponified, multipurpose grease with EP additives:

Company	**Lubricant designation**	
	Normal use conditions	Extreme use conditions
ARAL	Aralub HL 2	Aralub HLP 2
FINA	Marson L2	Marson EPL-2
ESSO	Beacon 2	Beacon EP 2
SHELL	Ratinax A	Tetinax AM

12.3.1 Lubrication point overview

	Lubrication point	Interval [h]	Number of lubrication points	Type of lubrication
Fig. 148				
1	Hydraulic cylinder for stand	100	2	Grease nipple
2	Drawbar bearing	50	2	Grease nipple
3	Parking brake	100	1	Grease the cables and guide rollers. Grease the spindle using the grease nipple.
4	Towing eye	50	1	Grease
Fig. 149				
1	Lifting cylinder	100	4	Grease nipple
Fig. 152				
1	Hydraulic cylinder for the hydropneumatic suspension	100	4	Grease nipple
Fig. 153				
	PTO shaft		5	Grease nipple
Fig. 150	**Following steering axle**			
Fig. 151	**Standard axle**			
1	King pin bearing, upper and lower	40		Grease nipple
2	Steering cylinder heads on steering axles	200		Grease nipple
3	Brake shaft bearing, outer and inner	200		Grease nipple
4	Linkage adjuster	1000		Grease nipple
5	ECO-Master automatic linkage adjuster	1000		Grease nipple
6	Renew wheel hub bearing grease, check taper roller bearings for wear	1000		Grease nipple

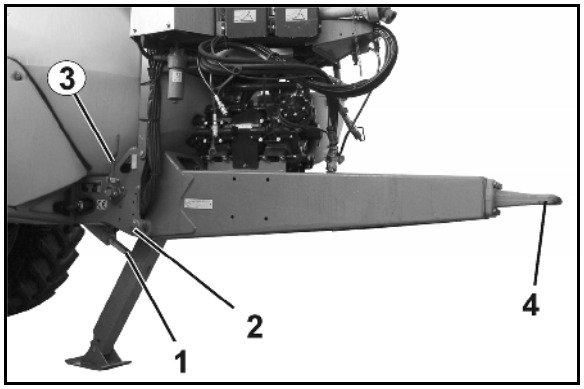


Fig. 148

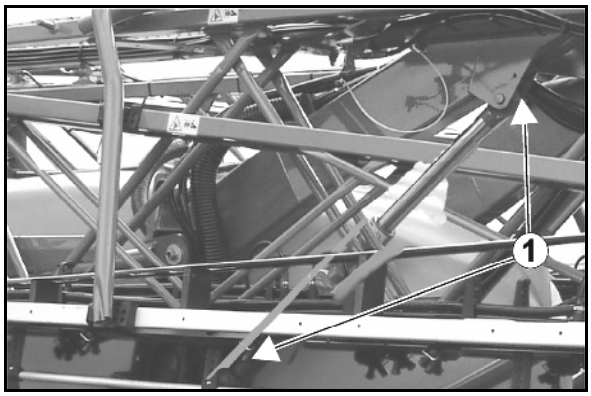


Fig. 149

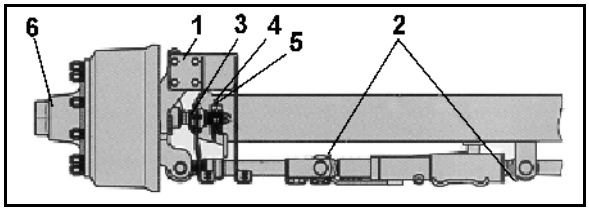


Fig. 150

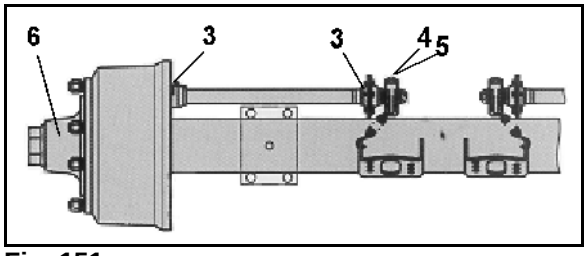


Fig. 151

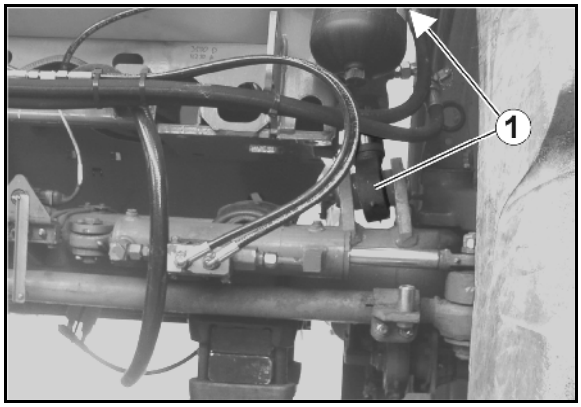


Fig. 152

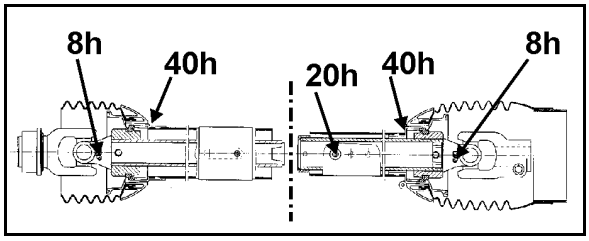


Fig. 153

- For winter operation, grease the protective tubes to prevent them from freezing.
- Also observe the installation and service instructions from the PTO shaft manufacturer, which are fastened to the PTO shaft.

Steering cylinder heads on steering axles

In addition to the lubrication work, you must also make sure that the steering cylinder and the supply line are always bled.

Brake shaft bearing, outer and inner

Caution: no grease or oil should be allowed to get into the brakes. Depending on the model series, the cam bearing for the brakes may not be sealed.

Only use lithium saponified grease with a dropping point greater than 190 °C.

ECO-Master automatic linkage adjuster

Each time the brake linings are replaced:

1. Remove the rubber stopper cap.
2. Apply grease (80 g) until sufficient clean grease escapes at the adjusting screw.
3. Slacken the adjusting screw by approximately one turn with a ring spanner. Actuate the brake lever several times by hand.
4. The automatic readjustment should function smoothly. Repeat several times, as necessary.
5. Refit the stopper cap. Grease again.

Renewing the wheel hub bearing grease

1. Jack up the vehicle securely and release the brakes.
2. Remove the wheels and dust caps.
3. Remove the lynch pin and unscrew the axle nut.
4. Use a suitable extraction device to remove the wheel hub and brake drum, taper roller bearing and sealing elements from the axle stub.
5. Label the removed wheel hubs and bearing cages so that you do not confuse them when refitting.
6. Clean the brakes, check for wear, sound condition and function and replace worn parts.

   The interior of the brake must be kept free from lubricants and dirt.
7. Thoroughly clean the interior and exterior of the wheel hubs. Remove all traces of old grease. Thoroughly clean the bearings and seals (diesel oil) and check for reusability.

   Before refitting the bearings, lightly grease the bearing carrier and then refit all parts in the reverse order. Carefully fit parts with press fits and pipe bushings so that they are not twisted or damaged.

   The bearings, the wheel hub cavity between the bearings and the dust cap must be smeared with grease before fitting. The grease should fill approximately a quarter to a third of the space in the fitted hub.
8. Fit the axle nut and adjust the bearing and brake. Finally, carry out a function check and an appropriate test run and rectify any detected faults.

The wheel hub bearing must only be greased with BPW special longlife grease with a dropping point greater than 190 °C.

The wrong grease or too great a quantity can result in damage.

Mixing lithium-saponified grease with sodium-saponified grease can result in damage caused by incompatibility.

12.4 Maintenance schedule – overview

- **Carry out maintenance work when the first interval is reached.**
- **The times, continuous services or maintenance intervals of any third party documentation shall have priority.**

After the first working run

Component	Maintenance work	see page	Specialist workshop
Wheels	• Wheel nut check	202	X
Hydropneumatic sprung suspension	• Check if the screws are mechanically secure.	203	
Trailer hitch	• Check if the screws are mechanically secure.	203	
Hydraulic hose lines	• Check for leak tightness	204	
Pumps	• Check the oil level	211	

On a daily basis

Component	Maintenance work	see page	Specialist workshop
Fluid filter (Profi-folding)	• Check the clogging indicator	207	
	If necessary, replace		X
Spray liquid tank	• Clean and/or flush	187	
Line filter in the nozzle lines (if present)		219	
Spraying nozzle		218	
Air reservoir for the air brake	• Drain	205	

Every week/ 50 operating hours

Component	Maintenance work	see page	Specialist workshop
Hydraulic hose lines	• Check for defects • Check for leak tightness	204	X
Wheels	• Chec k the air pressure.	202	

Every three months / 200 operating hours

Component	Maintenance work	see page	Specialist workshop
Dual-circuit service brake system	• Check for leak tightness • Check pressure in the air reservoir • Check brake cylinder pressure • Visual inspection of brake cylinder • Joints on brake valves, brake cylinders and brake linkages	200	X
	• Linkage adjuster brake settings	198	X
	• Brake pad check		X
	• Automatic load-dependent brake force regulator (ALB)	201	X
Pumps	• Check belt tension	212	X
Wheels	• Check play on wheel hub bearings	197	X
Line filter	• Clean • Replace damaged filter inserts	219	
Hydropneumatic sprung suspension	• Check if the screws are mechanically secure	203	
Axle holder on the hydropneumatic sprung suspension	• Check the screws for firm seating	203	X
Parking brake	• Check the braking effect with the brake on	201	

Annually / 1,000 operating hours

Component	Maintenance work	see page	Specialist workshop
Pumps	• Oil change every 500 operating hours	211	X
	• Check valves and, if necessary, replace	213	X
	• Check the piston diaphragm and, if necessary replace	214	X
Flow meter and return flow meter	• Calibrate the flow meter • Align the return flow meter	215	
Nozzles	• Calibrate the field sprayer and check the lateral distribution; if necessary, replace worn nozzles	218	
Automatic linkage adjuster	• Brake settings	198	X
	• Check for function		X
Brake drum	• Check for dirt	197	X

As necessary

Component	Maintenance work	see page	Specialist workshop
Super-S boom **Super-L** boom	• Correct the settings	208	
Electric lighting	• Replace defective bulbs	221	
solenoid valves	• Cleaning	207	
Hydraulic throttle valve	• Adjust the actuation speed	208	
Drawbar	• Replace worn parts	195	

12.5 Drawbars

DANGER

- **Replace damaged drawbars immediately on road safety grounds.**
- **Repairs may only be carried out by the manufacturing factory.**
- **For reasons of safety, performing welding and drilling work on the drawbar is prohibited**

Yoke bar

The pulling eye diameter of the yoke bar, when new, is 40 or 50 mm.

Wear to the pulling eye is permissible; this will increase the pulling eye diameter by up to 1.5 mm.

If wear is greater than this, the wearing bushing on the pulling eye must be promptly replaced.

Hitch drawbar

Wear to the pulling eye is permissible; this will increase the pulling eye diameter by up to 1.5 mm.

If wear is greater than this, the ball point coupling on the eye must be promptly replaced.

12.6 Axle and brake

For optimum brake performance with a minimum of wear, we recommend that the brakes on the tractor are balanced with those on the trailed sprayer. After the service braking system has been run in for a suitable period, arrange for the brakes to be balanced by a specialist workshop.

Have the balancing process carried out before these empirical values are reached if you discover excessive wear on the brake pads.

To avoid problems with the brakes, adjust all vehicles in accordance with EC Directive 71/320 EEC.

WARNING

- **Repair and adjustment work on the service braking system should only be carried out by trained specialist personnel.**
- **Special care is required for welding, torch cutting and drilling work in the vicinity of brake lines.**
- **Always carry out a braking test after any adjusting or repair work on the braking system**

General visual inspection

WARNING

Carry out a general visual inspection of the brake system. Observe and check the following criteria:

- **Pipe lines, hose lines and coupler heads must not be externally damaged or corroded.**
- **Hinges, e.g. on fork heads, must be properly secured, easy to move, and not worn out.**
- **Ropes and cables**
  - **must be properly run.**
  - **may not have any visible cracks.**
  - **may not be knotted.**
- **Check the piston stroke on the brake cylinders, and adjust as necessary.**
- **The air reservoir must not**
  - **move around in the tensioning belts.**
  - **be damaged.**
  - **show any outward signs of corrosion damage.**

Checking the brake drum for dirt

1. Unscrew the two cover plates (Fig. 154/1) on the inside of the brake drum.
2. Remove any dirt and plant debris which may have entered the drum.
3. Refit the cover plates.

CAUTION

Dirt entering the drums may be deposited on the brake pads (Fig. 154/2) and thus die appreciably reduce brake performance.

Risk of accident.

If dirt is discovered in the brake drum, the brake pads must be inspected by a specialist workshop.

For this to happen, the wheel and brake drum must be removed.

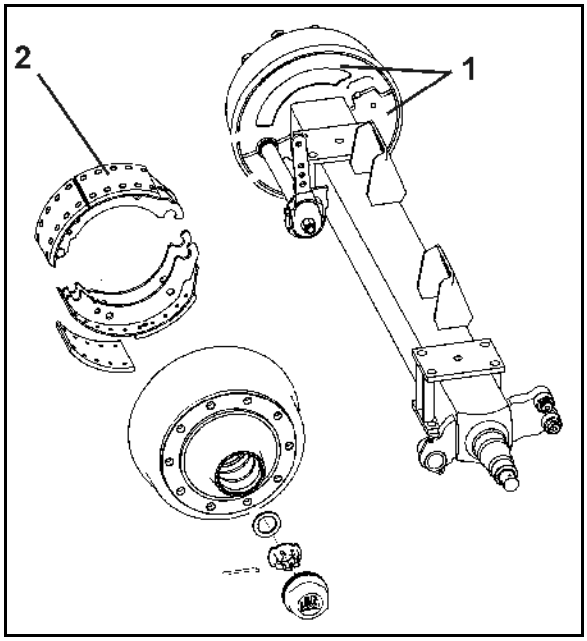


Fig. 154

Checking the play on wheel hub bearings

To check the play on wheel hub bearings, raise the axle until the wheels turn freely. Release the brake. Place a lever between the tyre and the ground and check the play.

If bearing play can be detected:

Adjust the bearing play

- Remove the dust cup or hub cap.
- Remove the split pin from the axle nut.
- Tighten the wheel nut while turning the wheel at the same time until the wheel hub is lightly braked as it turns.
- Turn axle nut back to the next available split pin hole. To the next matching hole (max. 30°).
- Fit split pin and bend slightly open.
- Top up the dust cap with high melting point grease and drive it into, or screw it onto the wheel hub.

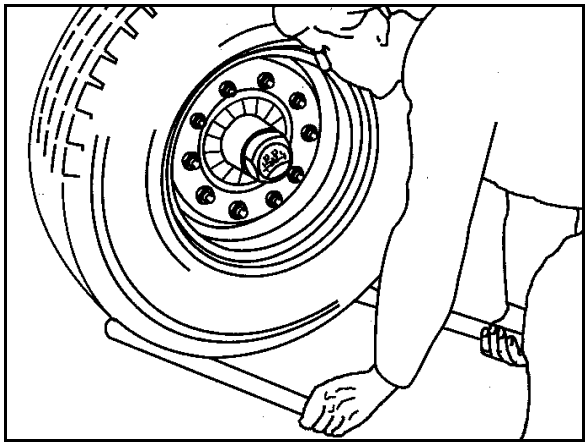


Fig. 155

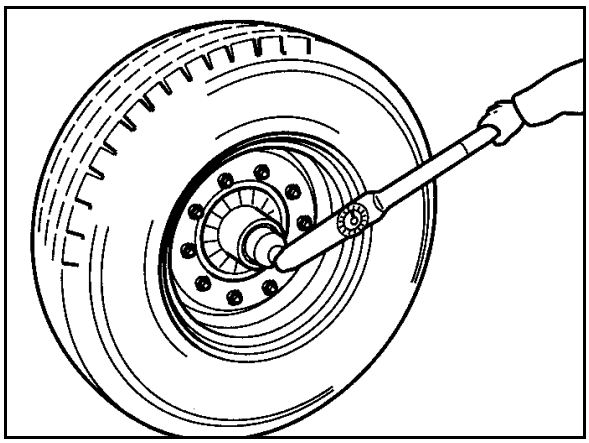


Fig. 156

Brake pad check

Open the inspection hole (Fig. 157/1) by pulling out the rubber stopper (if present).

At a residual thickness

a: for riveted pads 5 mm

(N 2504) 3 mm

b: for adhesive pads 2 mm

the brake pad must be replaced.

Reinsert the rubber tab.

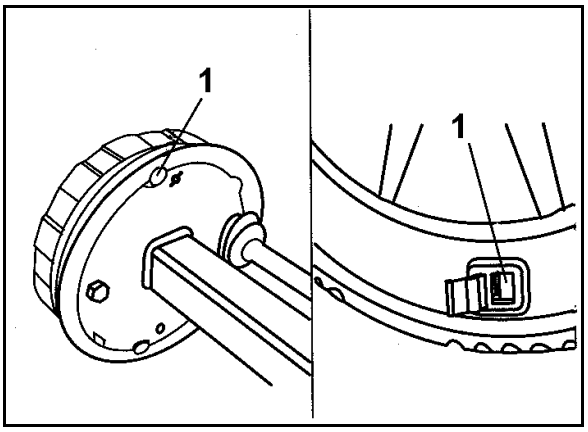


Fig. 157

Brake adjustment

Depending on use, the wear and function of the brakes must be constantly checked and, if necessary, readjustment must be carried out. Readjustment is required after using approx. 2/3 of the max. cylinder stroke for emergency braking. To do this, jack up the axle and secure it against unintended movement.

Adjusting the linkage adjuster

Move the linkage adjuster by hand in the pressure direction. If the free travel of the long-stroke diaphragm cylinder pressure rod is max. 35 mm, the wheel brake must be readjusted.

Adjustments are made using the readjustment hexagon bolt on the linkage adjuster. Set the free travel "a" to 10-12 % of the connected brake lever length "B",
e.g. lever length 150 mm = free travel 15 – 18 mm.

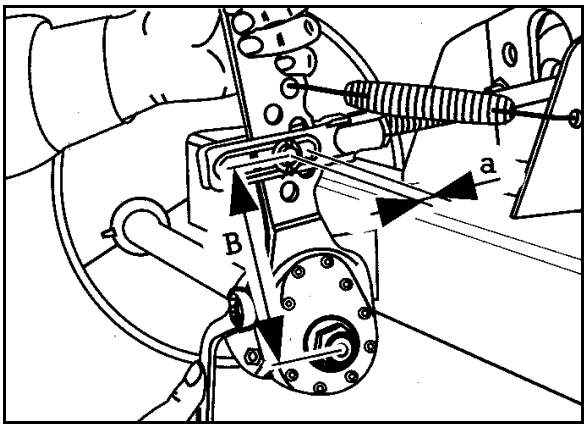


Fig. 158

Adjusting the automatic linkage adjuster

Basic settings are made in the same way as for the standard linkage adjuster. Readjustment occurs automatically at a cam rotation of approx. 15°.

The ideal lever position (which cannot be altered owing to the attachment of the cylinder) is approx. 15° before perpendicularity, and the same in the actuation direction.

Checking the function of the automatic linkage adjuster

1. Remove the rubber stopper cap.
2. Slacken the adjusting screw (arrow) with a ring spanner approx. ¾ of a turn anti-clockwise. There must be a free travel of at least 50 mm for a lever length of 150 mm.
3. Actuate the brake lever several times by hand. This should cause a smooth automatic readjustment; it should be possible to hear the coupling engaging and, on the back stroke, the adjusting screw should turn clockwise slightly.
4. Refit the stopper cap.
5. Lubricate with BPW ECO_Li91 special high melting point grease.

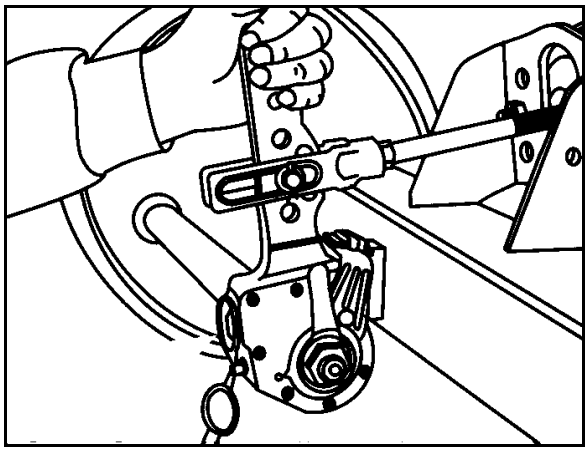


Fig. 159

Air reservoir

Drain the air reservoir every day.

(1) Air reservoir
(2) Tensioning belts
(3) Drainage valve
(4) Test connection for pressure gauge

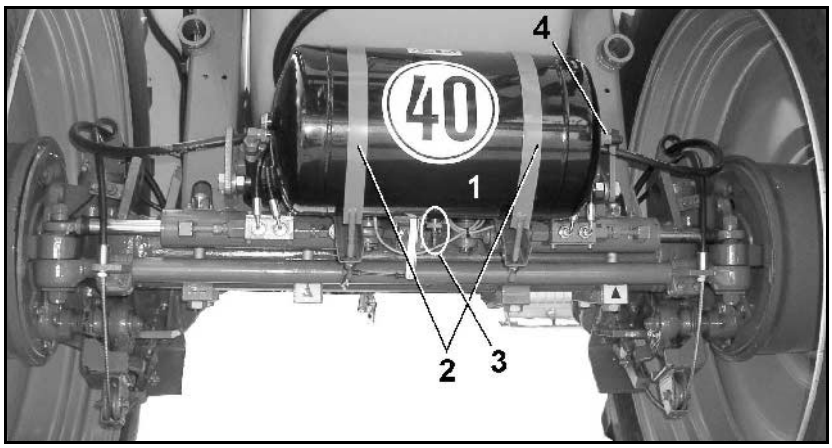


Fig. 160

1. Pull the drain valve in a sideways direction using the ring until no more water escapes from the air reservoir.

→ Water flows out of the drain valve.

2. Unscrew the drain valve from the air reservoir and clean the reservoir if there are signs of dirt.

Inspection instructions for the dual circuit service brake system

1. Leak tightness check

1. Check all connections, pipe lines, hose lines and screw connections for leak tightness.
2. Remedy leakages.
3. Repair any areas of chafing on pipes and hoses.
4. Replace porous and defective hoses.
5. The dual-circuit service brake system may be considered leak-proof if the drop in pressure is no more than 0.15 bar after 10 minutes.
6. Seal any leaking areas or replace leaking valves.

2. Checking the pressure in the air reservoir

1. Connect a pressure gauge to the test connection on the air reservoir.

   Set value 6.0 to 8.1 $^{+0.2}$ bar

3. Checking the brake cylinder pressure

1. Connect a pressure gauge to the test connection on the brake cylinder.

   Set value: with brake not applied 0.0 bar

4. Visual inspection of the brake cylinder

1. Check the dust sleeves or gaiters (Fig. 160/5) for damage.
2. Replace damaged parts.

5. Joints on brake valves, brake cylinders and brake linkages

Joints on brake valves, brake cylinders and brake linkages must move freely. Grease or lightly oil, if necessary.

12.6.1 Automatic load-dependent brake force regulator (ALB)

Check the brake pressure:

connect a pressure gauge to the test connection on the brake cylinder.

if the brake pressure deviates from the required values, set the brake pressure on the ALB via the eye bolts.

1. **Container empty: set dimension X until the brake pressure of 3.5 bar is reached.**

- Unscrew the eye bolt.

→ The test pressure reduces

- Screw the eye bolt in

→ The test pressure increases

2. **Container at nominal volume minus 10 to 15 %: set dimension Y until the brake pressure of 6.5 bar is reached.**

- Unscrew the eye bolt

→ The test pressure increases

- Screw the eye bolt in

→ The test pressure reduces

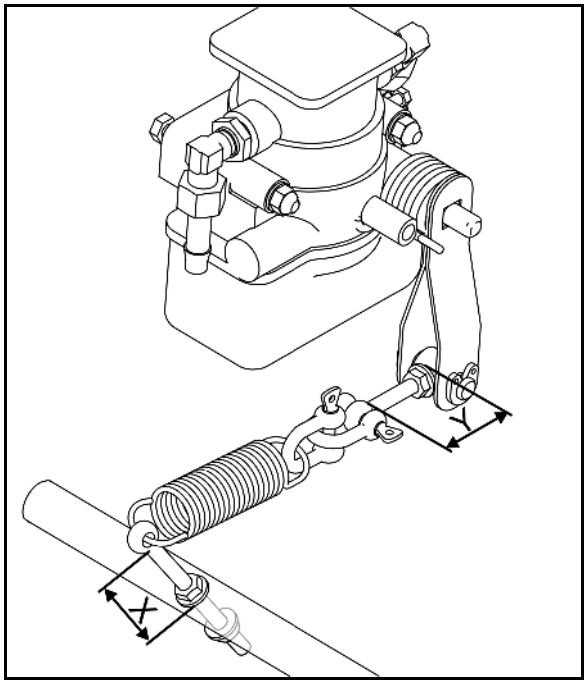


Fig. 161

12.7 Parking brake

On new machines, the brake cables of the parking brake may stretch.

Readjust the parking brake,

- if three quarters of the spindle tensioning distance is required to firmly apply the parking brake.
- if you have just fitted new brake pads.

Adjusting the parking brake

When the parking brake is off, the brake cable must be slightly slack. However, the brake cable must not rest or chafe against other parts of the vehicle.

1. Release the cable clamps.
2. Shorten the brake cable as appropriate and retighten the cable clamps.
3. Check for the correct braking effect from the parking brake when applied.

12.8 Tyres / wheels

- **Required tightening torque for wheel nuts or bolts:**

  510 Nm

- Regularly check the
  - wheel nuts for firm seating.
  - tyre pressure (for information on this, see section 12.8.1).
- Only use the tyres and wheels which we have specified (see page 56).
- Repair work on tyres must only be carried out by specialists using suitable assembly tools.
- Tyre fitting requires sufficient skills and proper assembly tools.
- Use the jack only at the jacking points indicated.

12.8.1 Tyre pressures

- The required tyre pressure is dependent on
  - tyre size.
  - tyre loading capacity.
  - speed.
- The operational performance of the tyres is reduced
  - by overloading.
  - if tyre pressure is too low.
  - if tyre pressure is too high.

- Check tyre pressures regularly when the tyres are cold, i.e. before starting a run (see page 56).
- The difference in pressure between the tyres on one axle must be no greater than 0.1 bar.
- Tyre pressure can be raised by up to 1 bar after a fast run or in warm weather. Tyre pressure should on no account be reduced as it is then too low when the tyres cool down.

12.8.2 Fitting tyres

- Remove any instances of corrosion from the wheel rim seating surfaces before fitting a new / another tyre. Corrosion can cause damage to the wheel rims when the vehicle is in operation.
- When fitting new tyres, always use new valves for tubeless tyres or new inner tubes.
- Always fit the valves with valve caps which have a gasket insert.

12.9 Hydropneumatic sprung suspension

Check if the screws are mechanically secure.

Note the specified tightening torque.

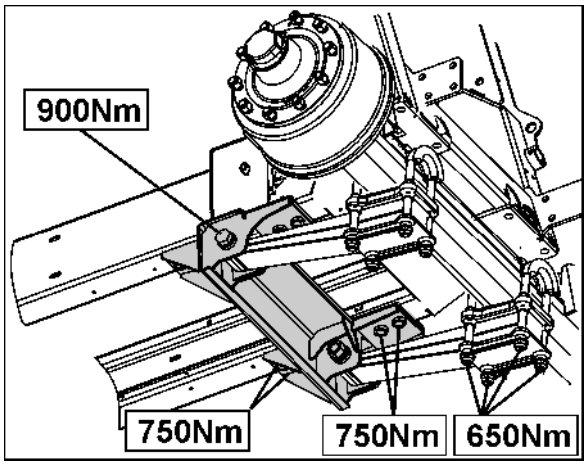


Fig. 162

12.10 Drawbar

Check if the screws are mechanically secure.

Note the specified tightening torque.

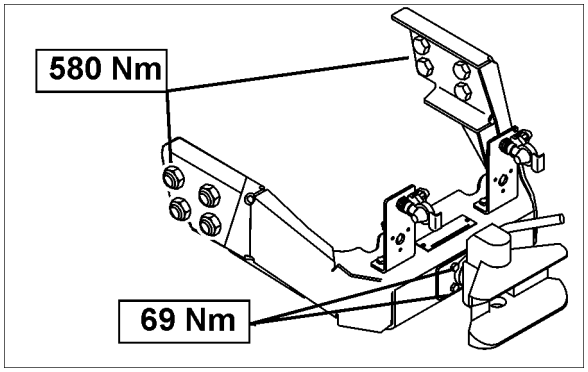


Fig. 163

12.11 Hydraulic system

WARNING

Risk of infection through the high pressure hydraulic fluid of the hydraulic system entering the body.

- Only a specialist workshop may carry out work on the hydraulic system.
- Depressurise the hydraulic system before carrying out work on the hydraulic system.
- When searching for leak points, always use suitable aids.
- Never attempt to plug leaks in hydraulic hose lines with your hand or fingers.

  Escaping high pressure fluid (hydraulic fluid) may pass through the skin and ingress into the body, causing serious injuries.

  If you are injured by hydraulic fluid, contact a doctor immediately. Risk of infection

- When connecting the hydraulic hose lines to the hydraulic system of connected machines, ensure that the hydraulic system is depressurised on both the drawing vehicle and the trailer.
- Ensure that the hydraulic hose lines are connected correctly.
- Regularly check all the hydraulic hose lines and couplings for damage and impurities.
- Have the hydraulic hose lines checked at least once a year by a specialist for proper functioning.
- Replace the hydraulic hose line if it is damaged or worn. Only use genuine AMAZONE hydraulic hose lines.
- The hydraulic hose lines should not be used for longer than six years. This period includes any storage time of a maximum of two years. Even with proper storage and approved use, hoses and hose connections are subject to natural ageing, thus limiting the length of use. However, it may be possible to specify the length of use from experience values, in particular when taking the risk potential into account. In the case of hoses and hose connections made from thermoplastics, other guide values may be decisive.
- Dispose of old oil in the correct way. If you have problems with disposal, contact your oil supplier.
- Keep hydraulic fluid out of the reach of children!
- Ensure that no hydraulic fluid enters the soil or waterways.

12.11.1 Labelling hydraulic hose lines

Valve chest identification provides the following information:

Fig. 164/...

(1) Manufacturer's marking on the hydraulic hose line (A1HF)

(2) Date of manufacture of the hydraulic hose lines (02 04 = February 2004)

(3) Maximum approved operating pressure (210 BAR).

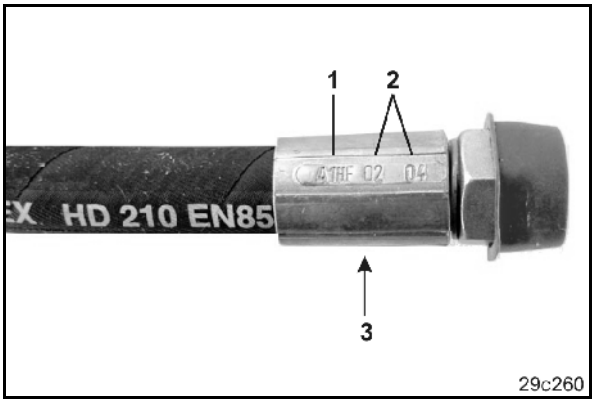


Fig. 164

12.11.2 Maintenance intervals

After the first 10 operating hours, and then every 50 operating hours

1. Check all the components of the hydraulic system for tightness.
2. If necessary, tighten screw unions.

Before each start-up:

1. Check the hydraulic hose lines for visible damage.
2. Repair any areas of chafing on hydraulic hose lines and pipes.
3. Replace any worn or damaged hydraulic hose lines immediately.

12.11.3 Inspection criteria for hydraulic hose lines

For your own safety and in order to reduce pollution, ensure the following inspection criteria.

Replace hoses if the respective hose fulfils at least one of the following criteria:

- Damage to the outer layer up to the ply (e.g. scouring points, cuts, cracks).
- Brittleness of the outer layer (crack formation of the hose material).
- Deformations which do not match the natural shape of the hose. Both in a depressurised and pressurised state or when bent (e.g. layer separation, bubble formation, pinching, bends).
- Leak points.
- Installation requirements not complied with.

- Life span of 6 years has been exceeded.

  The date of manufacture of the hydraulic hose line on the assembly is decisive for determining these six years. If the date of manufacture on the assembly is "2004", then the hose should not be used beyond February 2010. See also "Labelling of hydraulic hose lines".

Common causes for leaking hoses / pipes and connection pieces include:

- missing O-rings or seals
- damaged or badly fitting O-rings
- brittle or deformed O-rings or seals
- foreign bodies
- badly fitting hose clips

12.11.4 Installation and removal of hydraulic hose lines

Use

- only genuine **AMAZONE** replacement hoses. These hoses stand up to chemical, mechanical and thermal loads.
- hose clips made from V2A for fitting hoses, as a rule.

When installing and removing hydraulic hose lines, always observe the following information:

- Ensure cleanliness.
- Always install the hydraulic hose lines to ensure the following in all operating positions
  - o There is no tension, apart from the hose's own weight.
  - o There is no possibility of jolting on short lengths.
  - o External mechanical influences on the hydraulic hose lines are avoided.

    Use appropriate arrangements and fixing to prevent any scouring of the hoses on components or on each other. If necessary, secure hydraulic hose lines using protective covers. Cover sharp-edged components.
  - o The approved bending radii may not be exceeded.

- When connecting a hydraulic hose line to moving parts, the hose length must be appropriate so that the smallest approved bending radius is not undershot over the whole area of movement and/or the hydraulic hose line is not overtensioned.
- Fix the hydraulic hose lines at the specified fixing points. There, avoid hose clips, which impair the natural movement and length changes of the hose.
- The coating of hydraulic hose lines is not permitted.

12.11.5 Fluid filter

- Oil filter for Profi-folding
- Oil filter for hydraulic pump drive

Hydraulic fluid filter (Fig. 165/1) with contamination indicator (Fig. 165/2).

- Green Filter fully functional
- Red Replace filter

To remove the filter, twist off the filter cover and remove the filter.

CAUTION

Beforehand, depressurise the hydraulic system.

Otherwise there is a risk of injury from hydraulic fluid escaping at high pressure.

After replacing the filter, press the contamination indicator back into place.

→ Green ring again visible.

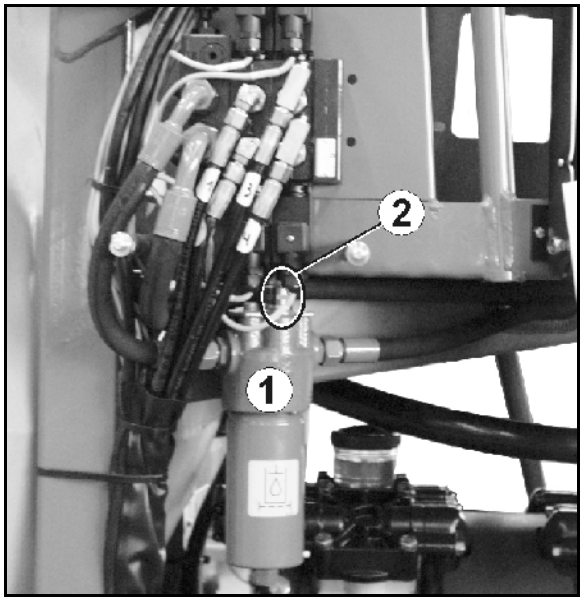


Fig. 165

12.11.6 Cleaning the solenoid valves

- hydraulic block for Profi-folding

To eliminate impurities from the solenoid valves, they must be flushed through. This may be necessary if deposit prevent the slider fully opening or closing.

1. Unscrew the magnetic cap (Fig. 166/1).
2. Remove the solenoid (Fig. 166/2).
3. Unscrew the valve rod (Fig. 166/3) with valve seats and clean with compressed air or hydraulic fluid.

VORSICHT

Risk of injury from hydraulic fluid escaping at high pressure!

Beforehand, depressurise the hydraulic system!

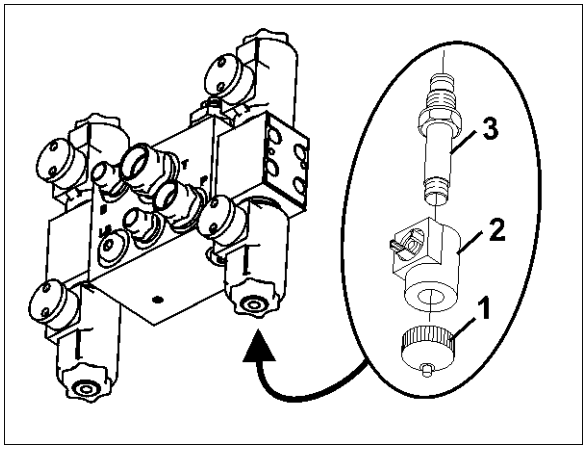


Fig. 166

12.11.7 Adjusting the hydraulic throttle valve

The operating speeds for the individual hydraulic functions are set at the factory from the valve block using the respective hydraulic throttle valves (fold/unfold sprayer boom, lock/unlock the swing compensation, etc.). However, depending on the type of tractor, it may be necessary to correct these speed settings.

The operating speed for a hydraulic function associated with a particular throttle pair can be adjusted by screwing the hexagon socket head screw on the corresponding throttle in or out.

- Reduce operating speed = screw in hexagon socket head screw.
- Increase operating speed = screw out hexagon socket head screw.

Always adjust the two throttles in a throttle pair equally when correcting the operating speed of a hydraulic function.

Folding via the tractor control unit

Fig. 167/…

(1) Hydraulic throttle valve - Height adjustment.

(2) Hydraulic throttle valve - Fold in the left boom extension.

(3) Hydraulic throttle valve - Fold in the right boom extension.

(4) Hydraulic throttle valve - Lock and unlock the swing compensation.

Fig. 168/…

(5) Hydraulic throttle valve - Fold out the boom extension.

(6) Hydraulic throttle valve - Fold in the boom extension.

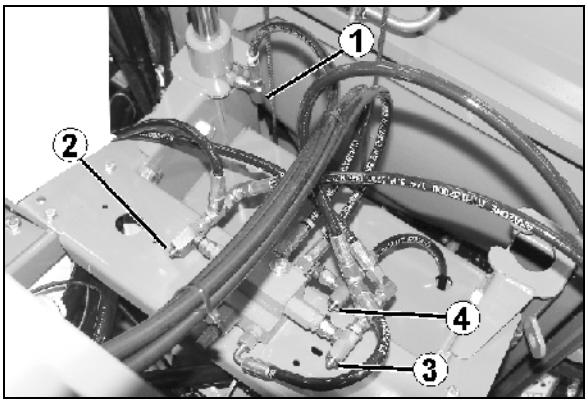


Fig. 167

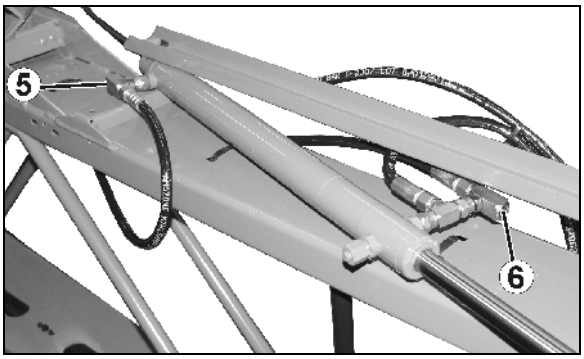


Fig. 168

Profi-folding I

Fig. 169/...

(1) Throttle - fold in the right-hand boom.

(2) Throttle - fold out the right-hand boom.

(3) Throttle - lock the swing compensation.

(4) Throttle transport safety catch.

(5) Hydraulic joints – tilt adjustment (the throttles are located on the hydraulic cylinder for tilt adjustment).

(6) Throttle - fold in the left-hand boom.

(7) Throttle - fold-out the left-hand boom.

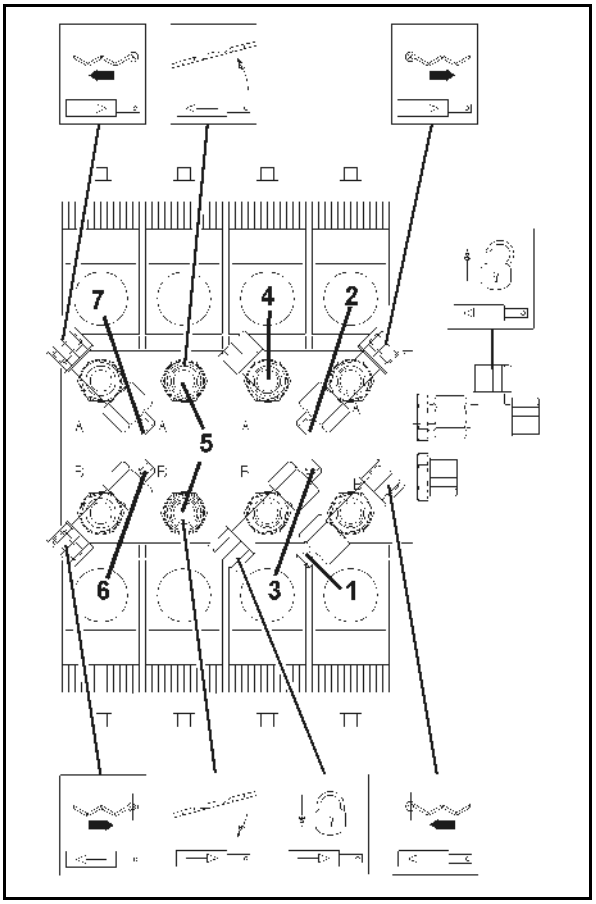


Fig. 169

Profi-folding II

Fig. 170/...

(1) Throttle - lower the right-hand boom.

(2) Throttle - raise the right-hand boom.

(3) Throttle - fold in the right-hand boom.

(4) Throttle - fold out the right-hand boom.

(5) Throttle - lock the swing compensation.

(6) Throttle transport safety catch.

(7) Hydraulic joints – tilt adjustment (the throttles are located on the hydraulic cylinder for tilt adjustment).

(8) Throttle - fold in the left-hand boom.

(9) Throttle - fold-out the left-hand boom.

(10) Throttle - lower the left-hand boom.

(11) Throttle - raise the left-hand boom.

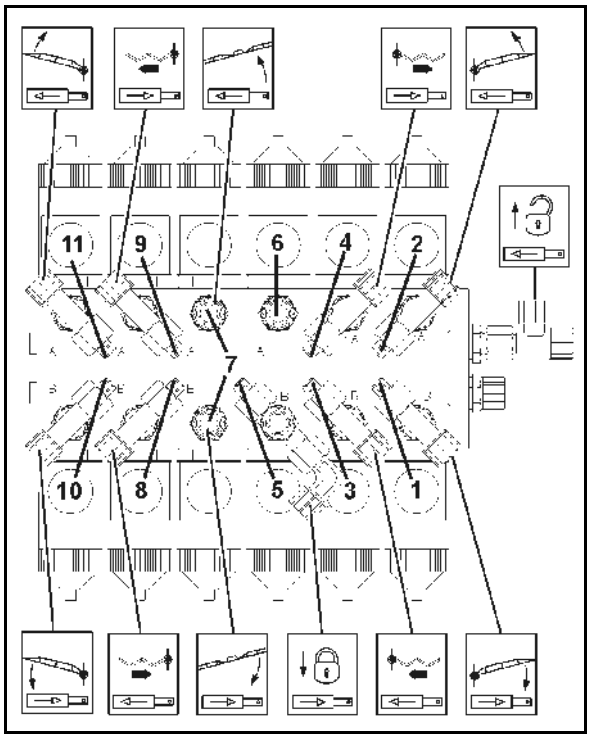


Fig. 170

12.12 Adjustments on the folded-out sprayer boom

Alignment parallel to the ground

With the sprayer boom folded out and correctly set, all the spraying nozzles must be of the same parallel distance to the ground.

If this is not the case, with the swing compensation **unlocked** align the folded-out sprayer boom by means of counterweights (Fig. 171/1). Secure the counterweights to the boom extension accordingly.

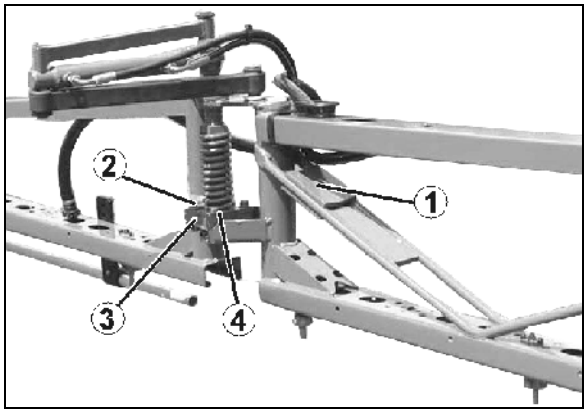


Fig. 171

Horizontal alignment

Viewed in the direction of travel, all boom sections of the sprayer boom must be flush in line. Horizontal alignment may be necessary

- after a long period of use
- or in the event of rough contact between the ground and the sprayer boom.

Inner boom section

1. Release the lock nut of the adjusting screw (Fig. 171/1).
2. Turn the adjusting screw against the stops until the inner boom is flush with the sprayer boom middle section.
3. Tighten the lock nut.

Outer boom section

1. Release the screws (Fig. 171/2) of the securing link (Fig. 171/3). The boom is aligned directly at the plastic catch (Fig. 171/4) through the slotted holes of the securing link.
2. Align the boom section.
3. Tighten the screws (Fig. 171/2).

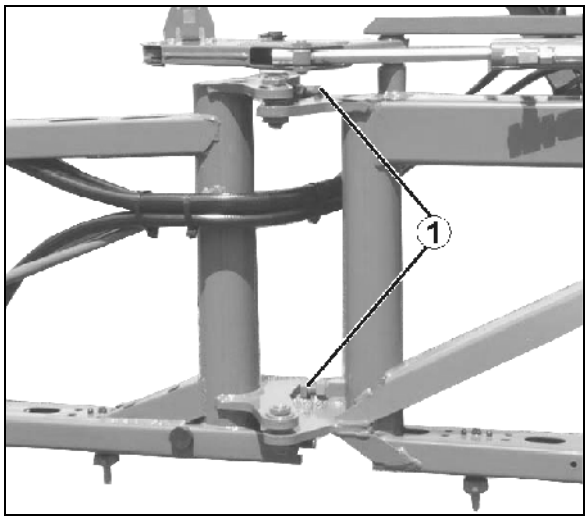


Fig. 172

12.13 Pump

12.13.1 Check the oil level

- Only use 20W30 branded oil or 15W40 multi purpose oil.
- Ensure the correct oil level. Damage may be caused both by the oil level being too low or too high.
- The read-off oil level can be averaged from the non-horizontal orientation of the pump in the hitch drawbar.

1. Check whether the oil level is visible at the mark (Fig. 175/1) with the pump not running and standing on a flat surface.
2. If the oil level is not visible at the mark (Fig. 175/1), remove the lid (Fig. 175/2) and top up with oil.

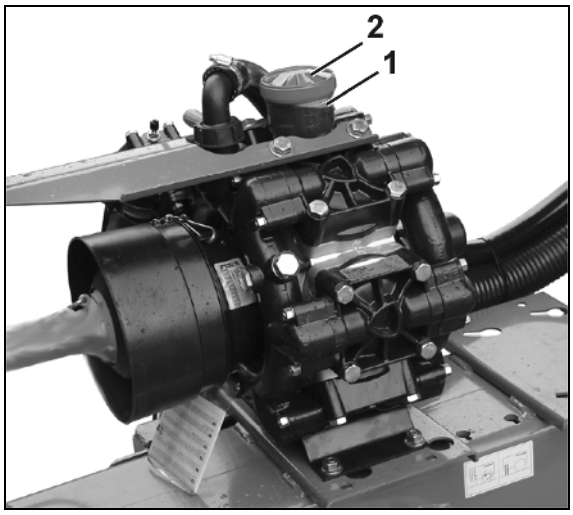


Fig. 173

12.13.2 Changing the oil

- After a few operating hours, check the oil level; top up if necessary.

1. Remove the pump.
2. Remove the lid (Fig. 175/2).
3. Drain the oil.
   - 3.1 Turn the pump on its head.
   - 3.2 Rotate the drive shaft by hand until the used oil has all run out.

     The option also exists to drain the oil from the drain plug. However, with this procedure a slight oil residue remains in the pump; we therefore recommend the first approach.
4. Place the pump on an even surface.
5. Turn the drive shaft left and right alternately and slowly fill with new oil. The right quantity of oil has been reached when the oil is visible at the mark (Fig. 175/1).

12.13.3 Cleaning

After each use, thoroughly clean the pump by pumping clear fresh water for several minutes.

12.13.4 Belt-driven pump

Checking/adjusting the belt tension

Test force Fe= 75 N

For a pump drive speed of 540 rpm:

→ maximum permissible deflection 14 mm

For a pump drive speed of 1,000 rpm:

→ maximum permissible deflection 16 mm

If the maximum deflection is exceeded, increase the belt tension by extending the wheelbase via the slotted holes.

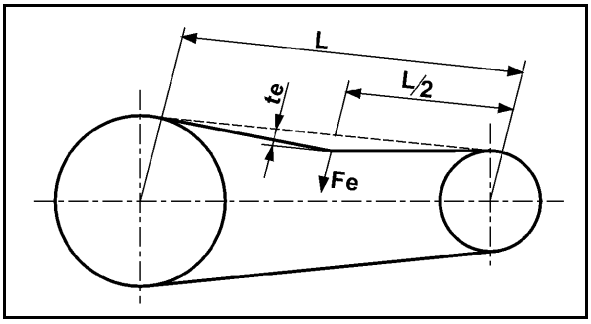


Fig. 174

Replacing the drive belt

Replace worn drive belts.

To do this:

1. Slacken the belt tension using the slotted holes on the lower V-belt pulley.
2. Remove the upper belt guard.
3. Unscrew a pump.
4. Replace the belt.

12.13.5 Checking and replacing the suction and pressure-side valves

- Pay attention to the respective installation positions of the valves on the suction and pressure sides before removing the valve groups (Fig. 175/5).
- When reassembling, ensure that the valve guide (Fig. 175/9) is not damaged. Damage may cause the valves to jam.
- Always tighten the nuts (Fig. 175/1,2) in a crosswise fashion using the specified torque. Improper tightening of the screws causes warping, which results in leaks.

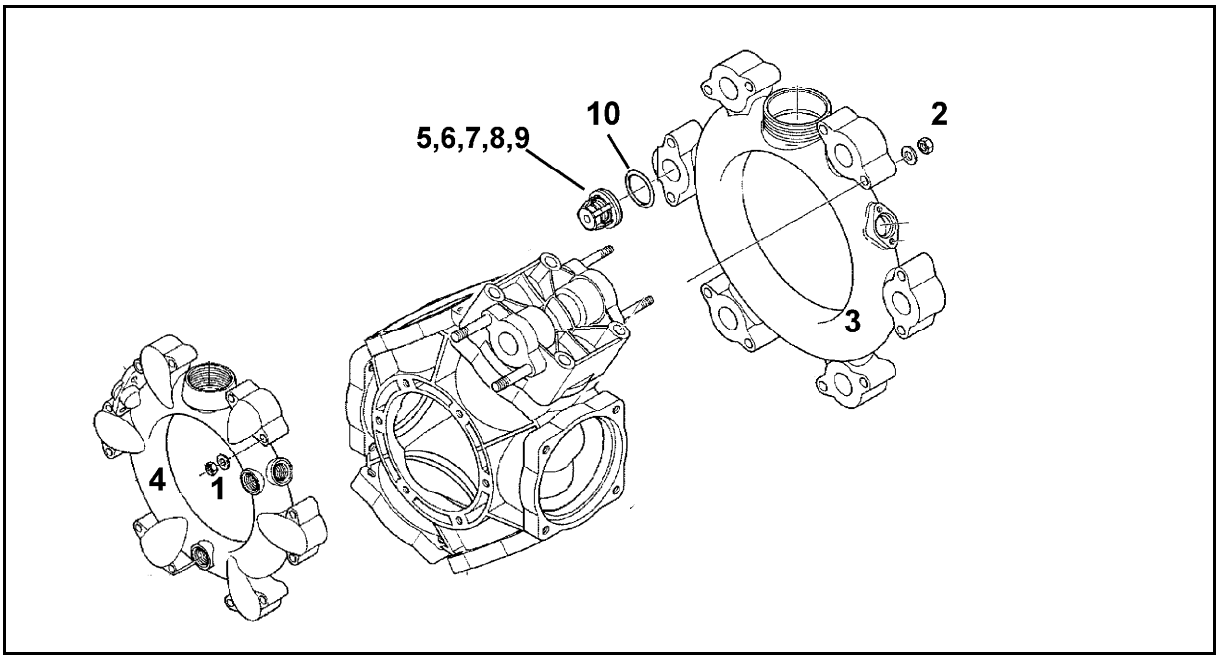


Fig. 175

1. If necessary, remove the pump.
2. Remove the nuts (Fig. 175/1,2).
3. Remove the suction and pressure port (Fig. 175/3 and Fig. 175/4).
4. Remove the valve groups (Fig. 175/5).
5. Check the valve seat (Fig. 175/6), valve (Fig. 175/7), valve spring (Fig. 175/8) and valve guide (Fig. 175/9) for wear or damage.
6. Remove the O-ring (Fig. 175/10).
7. Replace defective parts.
8. After testing and cleaning, fit the valve groups (Fig. 175/5).
9. Insert new O-rings (Fig. 175/10).
10. Mount the suction (Fig. 175/3) and pressure port (Fig. 175/4) on the pump housing.
11. Tighten the nuts (Fig. 175/1,2) in a crosswise fashion using a torque of **11 Nm**.

12.13.6 Checking and replacing the piston diaphragm

- At least once a year, check that the piston diaphragm (Fig. 176/8) is in perfect condition by removing it.
- Pay attention to the respective installation positions of the valves on the suction and pressure sides before removing the valve groups (Fig. 176/5).
- Check and replace the piston diaphragm for each piston individually. Only remove the next piston in sequence after the currently removed piston has been completely checked and refitted.
- Always swivel the piston to be checked upwards so that the oil in the pump housing does not run out.
- As a rule, replace all piston diaphragms (Fig. 176/8), even if only one piston diaphragm distorted, punctured or porous.

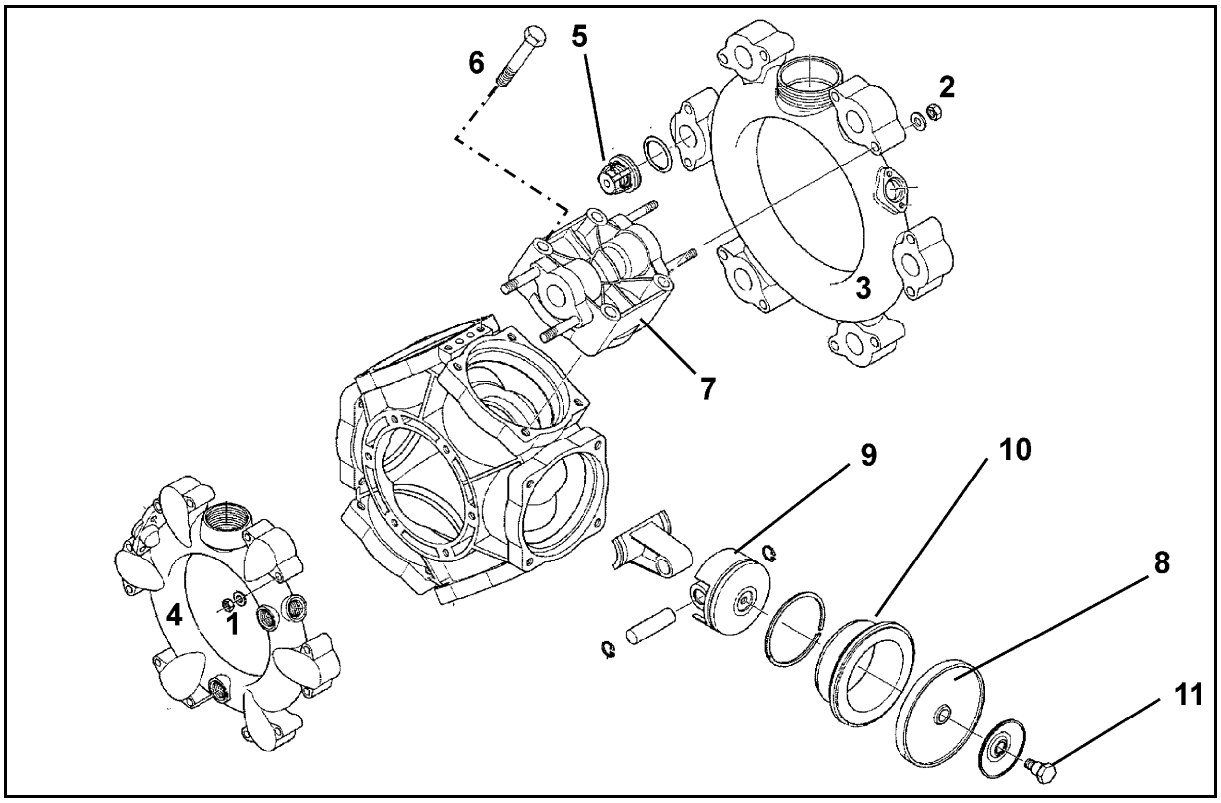


Fig. 176

Checking the piston diaphragm

1. If necessary, remove the pump.
2. Slacken the nuts (Fig. 176/1, 2).
3. Remove the suction and pressure port (Fig. 176/3 and Fig. 176/4).
4. Remove the valve groups (Fig. 176/5).
5. Remove the screws (Fig. 176/6).
6. Remove the cylinder head (Fig. 176/7).
7. Check the piston diaphragm (Fig. 176/8).
8. Replace the damaged piston diaphragm.

Replacing the piston diaphragm

- Ensure the correct position for the recesses and/or holes on the hydraulic cylinders.
- Secure the piston diaphragm (Fig. 176/8) with a washer disc and a screw (Fig. 176/11) on the piston (Fig. 176/9), so that the rim shows on the cylinder head side (Fig. 176/7).
- Always tighten the nuts (Fig. 176/1,2) in a crosswise fashion using the specified torque. Improper tightening of the nuts causes warping, which results in leaks.

1. Undo the screw (Fig. 176/11) and remove the piston diaphragm (Fig. 176/8) and the washer disc from the piston (Fig. 176/9).
2. If the piston diaphragm has been punctured, drain the oil/spray liquid mixture from the pump housing.
3. Remove the hydraulic cylinder (Fig. 176/10) from the pump housing.
4. Clean the pump housing by flushing it thoroughly with diesel oil or paraffin.
5. Clean all sealing faces.
6. Insert the cylinder (Fig. 176/10) back into the pump housing.
7. Fit the piston diaphragm (Fig. 176/8).
8. Mount the cylinder head (Fig. 176/7) on the pump housing and tighten the screws (Fig. 176/6) an equal amount in a crosswise fashion.

   Use adhesive for medium tight screw connections for the screw connection!
9. After testing and cleaning, fit the valve groups (Fig. 176/5).
10. Insert new O-rings.
11. Mount the suction (Fig. 176/3) and pressure port (Fig. 176/4) on the pump housing.
12. Tighten the nuts (Fig. 176/1,2) in a crosswise fashion using a torque of **11 Nm**.

12.14 Calibrate the flow meter

For information on this, observe the **AMATRON+** operating manual; section "Impulses per litre".

12.15 Field sprayer calibration

Test the field sprayer by carrying out calibration

- **before the start of the season.**
- **each time a nozzle is changed.**
- **to check the setting information in the spray tables.**
- **in the case of deviations between the actual and required spray rate [l/ha].**

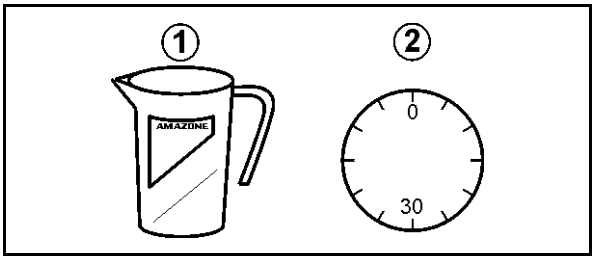
Any deviations between the actual and required spray rate [l/ha] may be caused by:

- the difference between the actual operational speed and that indicated on the tractor meter and/or
- natural wear to the spraying nozzles.

Calibration equipment:

(1) Quick-check beaker

(2) Stopwatch



Determining the actual spray rate while stationary via the individual nozzle output

Determine the nozzle output from at least 3 different nozzles. To do this, check one nozzle on the left boom, one on the right boom and one in the middle of the sprayer boom as described below.

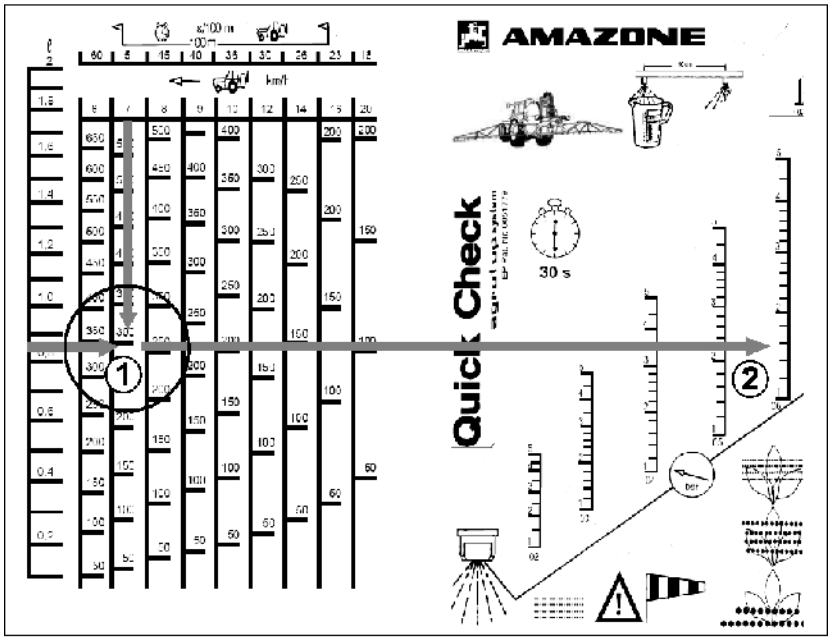
1. Determine the precise spray rate [l/ha] required for the crop protection measure.
2. Determine the required spray pressure.
3. **AMATRON+ / AMASPRAY+**:
   - 3.1 Enter the required spray rate into the operating terminal.
   - 3.2 Enter the permissible spray pressure range for the spraying nozzles fitted to the sprayer boom on the operating terminal.
   - 3.3 Switch the operating terminal from AUTOMATIC mode over to the MANUAL mode.
4. Fill the spray liquid tank with water.
5. Switch on the agitator.
6. Manually set the required spray pressure.
7. Switch on spraying and check that all nozzles are functioning perfectly.
8. Calculate the individual nozzle output [l/min] at several nozzles.
   To do so, hold the quick-check beaker under a nozzle for precisely 30 seconds.
9. Switch off spraying.
10. Calculate the average individual nozzle output [l/ha].

- Using the table on the quick-check beaker.
- By calculation.
- Using the spray table.

Example:

Nozzle size	'06'
Intended operational speed	7 km/h
Nozzle output on the left boom:	0.85 l/30s
Nozzle output in the centre	0.84 l/30s
Nozzle output on the right boom:	0.86 l/30s
Calculated average value:	**0.85 l/30s → 1.7 l/min**

1. Calculate the individual nozzle output [l/ha] using the quick-check beaker



(1) →calculated spread rate 290 l/ha
(2) →calculated spray pressure 1.6 bar

2. Calculate individual nozzle output [l/ha]

$$\frac{\text{d [l/min]} \times 1200}{\text{e [km/h]}} = \text{Spread rate[l/ha]}$$

- d: Nozzle output (calculated average value) [l/min]
- e: Operational speed [km/h]

$$\frac{1.7 \text{ [l/min]} \times 1200}{7 \text{ [km/h]}} = 291 \text{ [l/ha]}$$

3. Read the individual nozzle output [l/ha] from the spray table

From the spray table (see page 227):

→ Spread rate 291 l/ha
→ Spray pressure 1.6 bar

If the calculated values for spread rate/spray pressure do not agree with the set values:

- Calibrate the flow meter (see the operating manual for the operator control terminal)
- Check all nozzles for wear and blockages.

12.16 Nozzles

From time to time, check the seating of the slider (Fig. 177/7).

- To do this, insert the slider into the nozzle body (Fig. 177/2) as far as possible using moderate thumb pressure.

Do not insert the slider up to the stop when in a new condition under any circumstances.

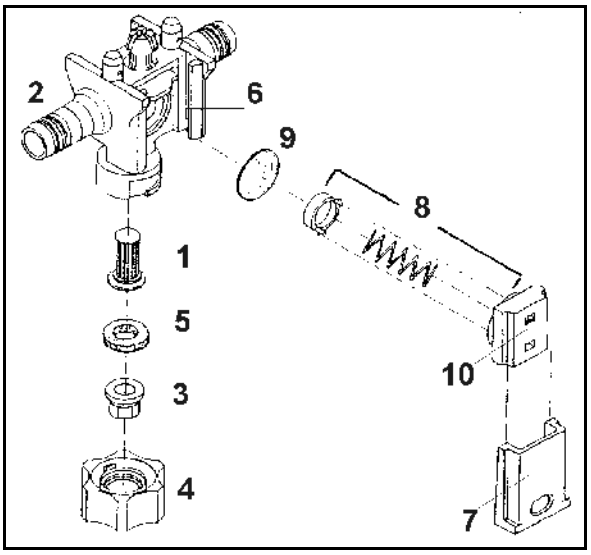


Fig. 177

12.16.1 Fitting the nozzle

1. Insert the nozzle filter (Fig. 177/1) into the nozzle body (Fig. 177/2) from below.
2. Insert the nozzle (Fig. 177/3) into the bayonet nut (Fig. 177/4)

Different coloured bayonet nuts are available for the different nozzles.

3. Insert the rubber seal (Fig. 177/5) above the nozzle.
4. Press a rubber seal into the seat for the bayonet nut.
5. Position a bayonet nut on the bayonet connection.
6. Screw on the bayonet nut up to the stop.

12.16.2 Removing the diaphragm valve if the nozzle is dripping

Deposits on the diaphragm seat (Fig. 177/6) can cause the nozzles to drip after the boom is shut-off. If this occurs, clean the diaphragm in question as follows:

1. Pull the slider (Fig. 177/7) out of the nozzle body (Fig. 177/2) towards the bayonet nut.
2. Remove the spring element (Fig. 177/8) and the diaphragm (Fig. 177/9).
3. Clean the diaphragm seat (Fig. 177/6).
4. Reassembly occurs in the reverse sequence.

Note the correct orientation for installing the spring element. For installation, the stepped, upwards-sloping edges on the left and right of the housing of the spring element (Fig. 177/10) must slope up in the direction of the boom profile.

12.17 Line filter

- Clean the line filters
  (Fig. 178/1) 3 - 4 months depending on operating conditions).
- Change damaged filter inserts.

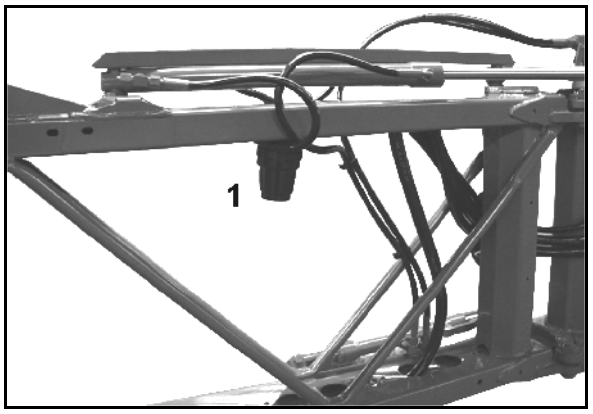


Fig. 178

12.18 Instructions on testing the field sprayer

- Only authorised centres are permitted to carry out spray tests.
- According to law, a spray test must be carried out:
  - o 6 months after commissioning (if not performed at time of purchase) at the latest, then
  - o every two years thereafter.

Field sprayer test kit (special equipment), order no.: 935680

Fig. 179/...

(1) Push-on cap (Order no.: 913 954) and connector (Order no.: ZF195)

(2) Flow meter connection (Order no.: 919967)

(3) Pressure gauge connection (Order no.: 7107000)

(4) O-Ring (Order no.: FC122)

(5) Hose connection (Order no.: GE095) (6) Sleeve nut (Order no.: GE021)

(7) Hose clip (Order no.: KE006)

(8) Plug-in socket (Order no.: 919345)

(9) O-Ring (Order no.: FC112)

(10) Turned socket (Order no.: 935679)

(11) Securing plug (Order no.: ZF195)

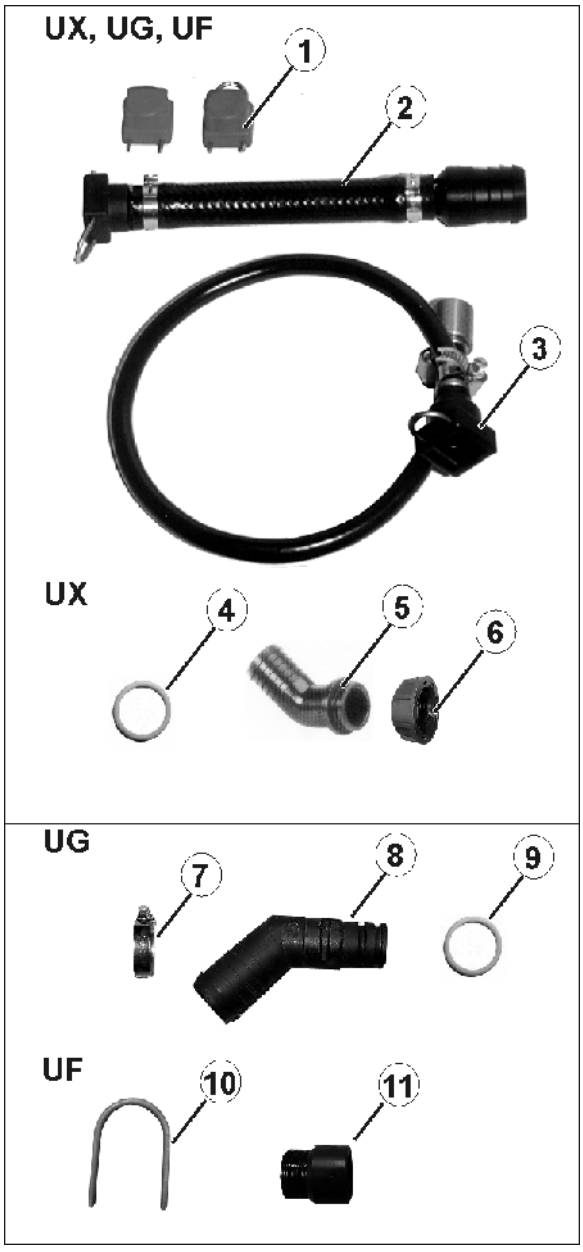


Fig. 179

Pump test - testing pump performance (delivery capacity, pressure)

1. Undo the sleeve nut (Fig. 180/1).
2. Attach the hose connection.
3. Tighten the sleeve nut.

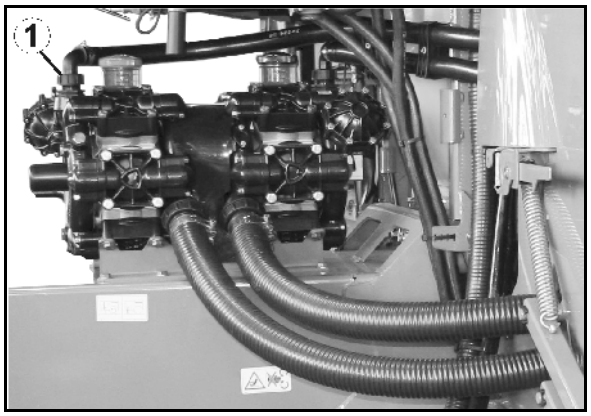


Fig. 180

Flow meter test

1. Remove all spray lines from the part width section valves (Fig. 181/1).
2. Connect the flow meter connection (Fig. 179/2) to a part width section valve and connect to the tester.
3. Block the connections for the remaining part width section valves using blanks (Fig. 179/1).
4. Switch on spraying.

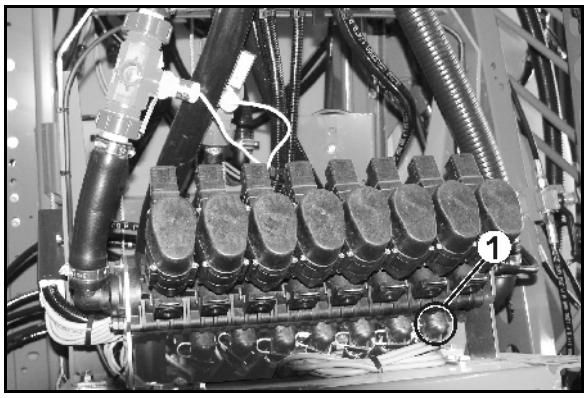


Fig. 181

Pressure gauge test

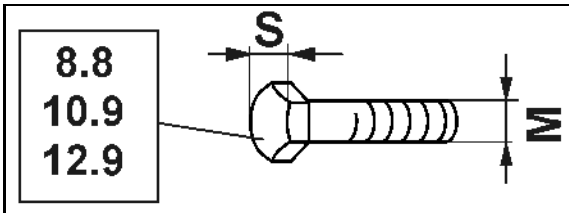
1. Remove a spray line from a part width section valve.
2. Connect the pressure gauge connection (Fig. 179/3) to a part width section valve with the help of the turned socket.
3. Screw the check gauge 1/4 of an inch into the inside thread.
4. Switch on spraying.

12.19 Electric lighting system

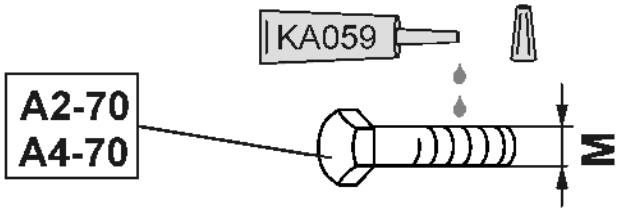
Replacement of light bulbs:

1. Unscrew the safety glass.
2. Remove the defective bulb.
3. Insert the replacement bulb (note the correct voltage and wattage).
4. Insert and screw on the sight glass.

12.20 Screw tightening torques



M	S	Nm 8.8	10.9	12.9
M 8	13	25	35	41
M 8x1		27	38	41
M 10	16 (17)	49	69	83
M 10x1		52	73	88
M 12	18 (19)	86	120	145
M 12x1,5		90	125	150
M 14	22	135	190	230
M 14x1,5		150	210	250
M 16	24	210	300	355
M 16x1,5		225	315	380
M 18	27	290	405	485
M 18x1,5		325	460	550
M 20	30	410	580	690
M 20x1,5		460	640	770
M 22	32	550	780	930
M 22x1,5		610	860	1050
M 24	36	710	1000	1200
M 24x2		780	1100	1300
M 27	41	1050	1500	1800
M 27x2		1150	1600	1950
M 30	46	1450	2000	2400
M 30x2		1600	2250	2700



M	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
Nm	2,3	4,6	7,9	19,3	39	66	106	162	232	326	247	314

12.21 Disposing of the field sprayer

Carefully clean the whole field sprayer (inside and out) before disposing of the field sprayer.

The following components are eligible for energy recovery*: spray liquid tank, induction bowl, flushing water tank, fresh water tank, hoses and plastic fittings.

Metal parts can be scrapped.

Follow the statutory requirements for each individual material.

* Energy recovery

is the process of reclaiming the energy contained in plastics by burning them and using the energy released to generate electricity and/or steam or to supply process heat. Energy recovery is suitable for mixed and contaminated plastics, in particular for any plastics which have come into contact with pollutants.

13 Spray table

13.1 Spray tables for flat-fan, anti-drift, injector and airmix nozzles, spraying height 50 cm

- The spray rates [l/ha] listed in the spray tables are only valid for water. To convert the spray rates given into AUS, multiply these by 0.88 and, for NP solutions, by 0.85.
- Fig. 182 helps with the selection of the right nozzle type. The nozzle type is determined by
  - the intended operational speed,
  - the required spray rate and
  - the required atomisation characteristic (fine, medium or coarse-dropped) of the crop protection agent used for the crop protection measure.
- Fig. 183 is used to
  - determine the nozzle size.
  - determine the required spray pressure.
  - determine the required individual nozzle output for calibrating the field sprayer.

Permissible pressure ranges for different nozzle types and sizes

Nozzle type	Manufacturer	Permissible pressure range [bar]	
		min. pressure	max. pressure
XRC	TeeJet	1	5
AD	Lechler	1,5	5
Air Mix	agrotop	1	6
IDK / IDKN	Lechler	1	6
ID / IS		2	8
IDN		2	8
AI	TeeJet	2	8
TTI		1	7
AVI Twin	agrotop	2	8
TD Hi Speed	agrotop	2	10

For further information about the nozzle characteristics, see the nozzle manufacturer's website.

www.agrotop.com / www.lechler-agri.de / www.teejet.com

Selecting the nozzle type

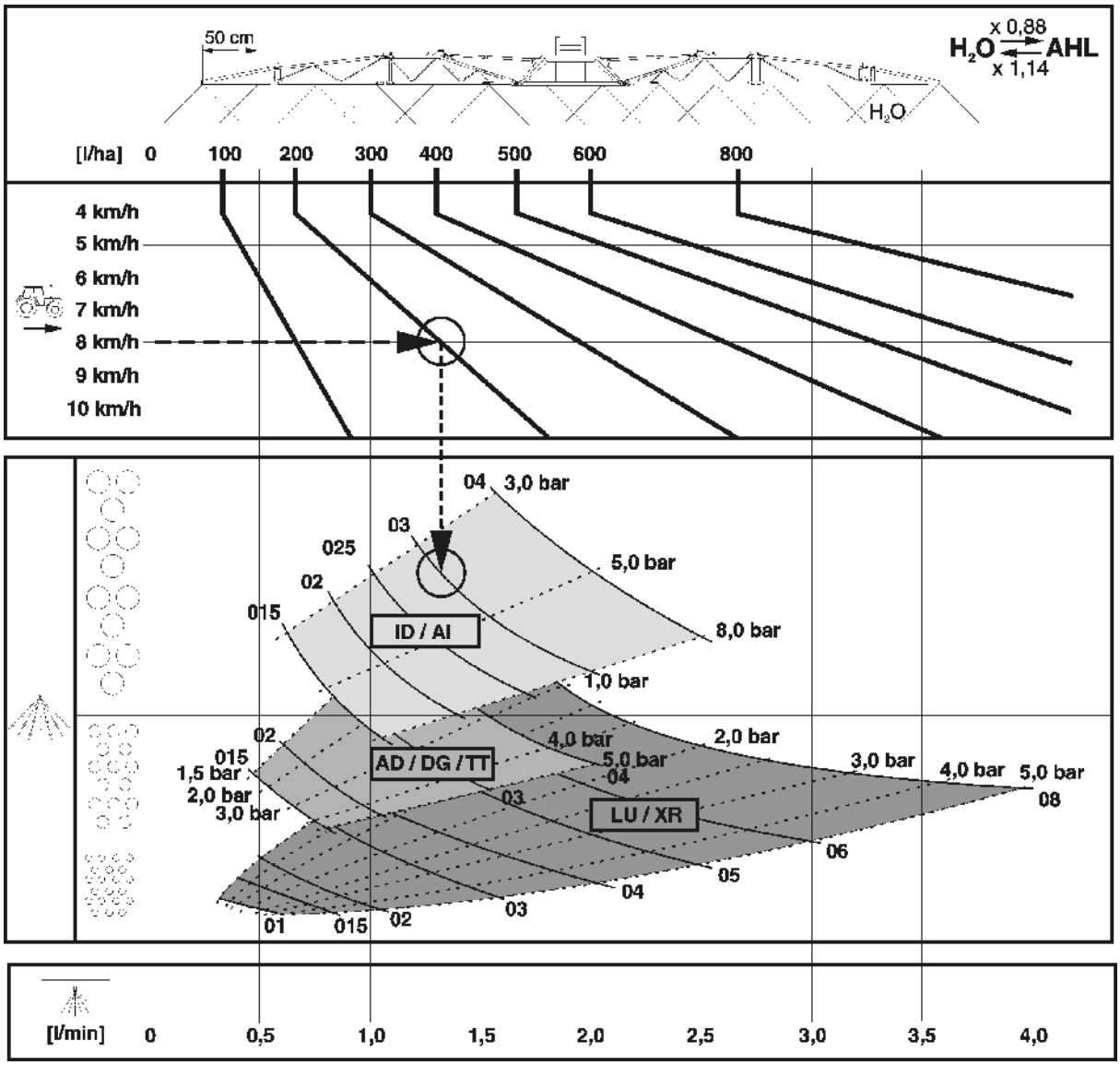


Fig. 182

Example:

Required spray rate:	**200 l/ha**
Intended operational speed:	**8 km/h**
Required atomisation characteristic for the crop protection measure:	**coarse-dropped** (fine drifting)
Required nozzle type:	?
Required nozzle size:	?
Required spray pressure:	? bar
Required individual nozzle output for calibrating the field sprayer:	? l/min

Determining the nozzle type, nozzle size, spray pressure and individual nozzle output

1. Determine the working point for the required spray rate (**200 l/ha**) and the intended operational speed (**8 km/h**).
2. At the working point, trace a line down the table. Depending on the position of the working point, this line will run through the cells for various nozzle types.
3. Select the best nozzle type for the crop protection measure in question, with reference to the required atomisation characteristic (fine, medium or coarse-dropped).

→ Nozzle choice for the example given above:

→ Nozzle type: **AI or ID**

4. Go to the spray table (Fig. 183).
5. In the column with the intended operational speed (**8 km/h**), find the required spray rate (**200 l/ha**) or a figure which is as close as possible to the required spray rate (in this case, for example, **195 l/ha**).
6. In the line with the required spray rate (**195 l/ha**),
   - o read the nozzle sizes in question. Select a suitable nozzle size (e.g.**'03'**).
   - o where the nozzle size column intersects with the selected nozzle size, read the required spray pressure (e.g. **3.7 bar**).
   - o read the required individual nozzle output (**1.3 l/min**) for calibrating the field sprayer.

Required nozzle type:	**AI / ID**
Required nozzle size:	**'03'**
Required spray pressure:	**3.7 bar**
Required individual nozzle output for calibrating the field sprayer:	**1.3 l/min**

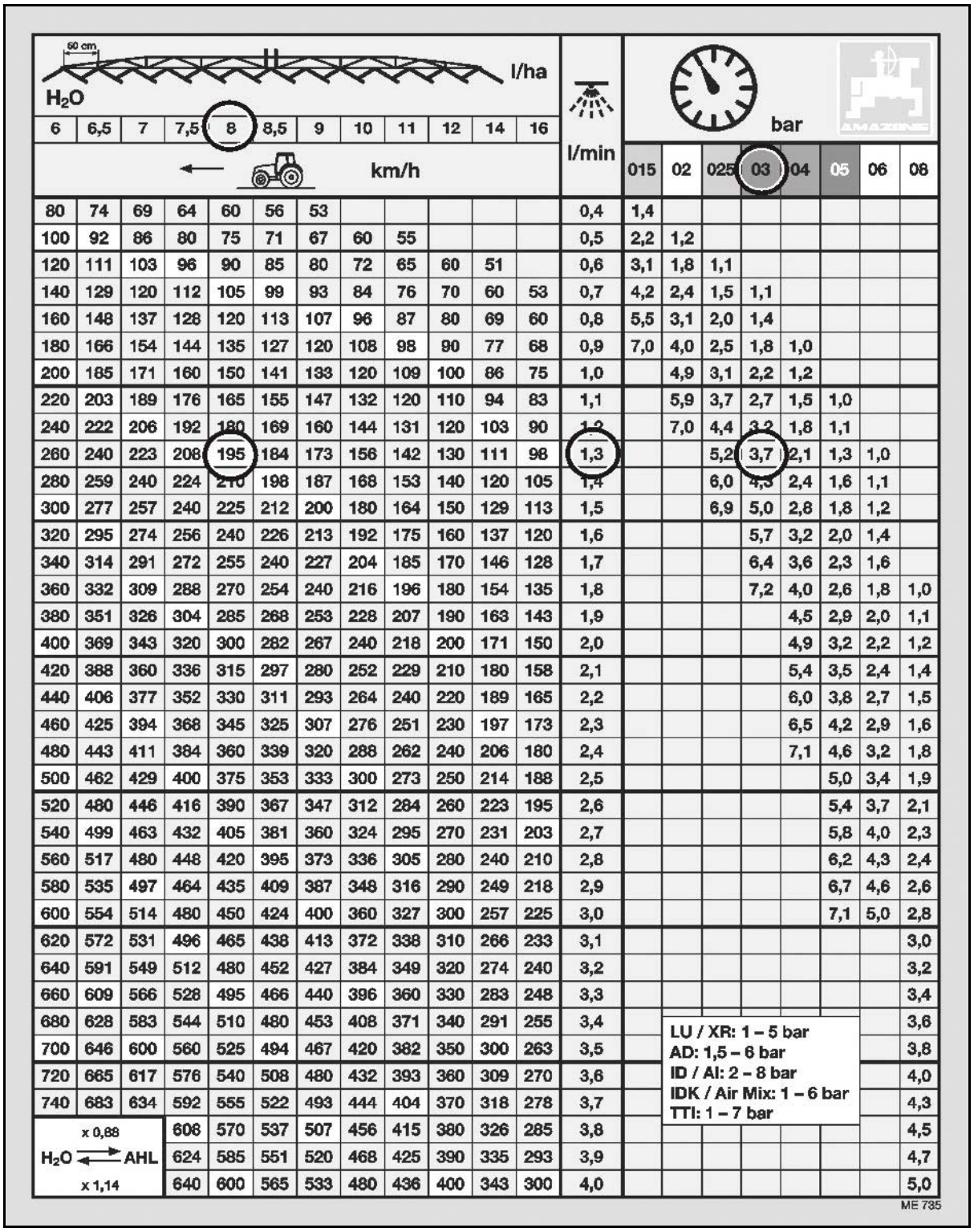

60 cm
l/ha
H2O
bar
6 6,5 7 7,5 8 8,5 9 10 11 12 14 16
km/h
l/min
015 02 025 03 04 05 06 08
80 74 69 64 60 56 53 0,4 1,4
100 92 86 80 75 71 67 60 55 0,5 2,2 1,2
120 111 103 96 90 85 80 72 65 60 51 0,6 3,1 1,8 1,1
140 129 120 112 105 99 93 84 76 70 60 53 0,7 4,2 2,4 1,5 1,1
160 148 137 128 120 113 107 96 87 80 69 60 0,8 5,5 3,1 2,0 1,4
180 166 154 144 135 127 120 108 98 90 77 68 0,9 7,0 4,0 2,5 1,8 1,0
200 185 171 160 150 141 133 120 109 100 86 75 1,0 4,9 3,1 2,2 1,2
220 203 189 176 165 155 147 132 120 110 94 83 1,1 5,9 3,7 2,7 1,5 1,0
240 222 206 192 180 169 160 144 131 120 103 90 7,0 4,4 3,2 1,8 1,1
260 240 223 208 195 184 173 156 142 130 111 98 1,3 5,2 3,7 2,1 1,3 1,0
280 259 240 224 210 198 187 168 153 140 120 105 6,0 4,3 2,4 1,6 1,1
300 277 257 240 225 212 200 180 164 150 129 113 1,5 6,9 5,0 2,8 1,8 1,2
320 295 274 256 240 226 213 192 175 160 137 120 1,6 5,7 3,2 2,0 1,4
340 314 291 272 255 240 227 204 185 170 146 128 1,7 6,4 3,6 2,3 1,6
360 332 309 288 270 254 240 216 196 180 154 135 1,8 7,2 4,0 2,6 1,8 1,0
380 351 326 304 285 268 253 228 207 190 163 143 1,9 4,5 2,9 2,0 1,1
400 369 343 320 300 282 267 240 218 200 171 150 2,0 4,9 3,2 2,2 1,2
420 388 360 336 315 297 280 252 229 210 180 158 2,1 5,4 3,5 2,4 1,4
440 406 377 352 330 311 293 264 240 220 189 165 2,2 6,0 3,8 2,7 1,5
460 425 394 368 345 325 307 276 251 230 197 173 2,3 6,5 4,2 2,9 1,6
480 443 411 384 360 339 320 288 262 240 206 180 2,4 7,1 4,6 3,2 1,8
500 462 429 400 375 353 333 300 273 250 214 188 2,5 5,0 3,4 1,9
520 480 446 416 390 367 347 312 284 260 223 195 2,6 5,4 3,7 2,1
540 499 463 432 405 381 360 324 295 270 231 203 2,7 5,8 4,0 2,3
560 517 480 448 420 395 373 336 305 280 240 210 2,8 6,2 4,3 2,4
580 535 497 464 435 409 387 348 316 290 249 218 2,9 6,7 4,6 2,6
600 554 514 480 450 424 400 360 327 300 257 225 3,0 7,1 5,0 2,8
620 572 531 496 465 438 413 372 338 310 266 233 3,1 3,0
640 591 549 512 480 452 427 384 349 320 274 240 3,2 3,2
660 609 566 528 495 466 440 396 360 330 283 248 3,3 3,4
680 628 583 544 510 480 453 408 371 340 291 255 3,4 3,6
700 646 600 560 525 494 467 420 382 350 300 263 3,5 3,8
720 665 617 576 540 508 480 432 393 360 309 270 3,6 4,0
740 683 634 592 555 522 493 444 404 370 318 278 3,7 4,3
x 0,88
H2O AHL
x 1,14
608 570 537 507 456 415 380 326 285 3,8 4,5
624 585 551 520 468 425 390 335 293 3,9 4,7
640 600 565 533 480 436 400 343 300 4,0 5,0
LU / XR: 1 – 5 bar
AD: 1,5 – 6 bar
ID / AI: 2 – 8 bar
IDK / Air Mix: 1 – 6 bar
TTI: 1 – 7 bar
ME 735

Fig. 183

13.2 Spraying nozzles for liquid manure

Nozzle type	Manufacturer	Permissible pressure range [bar]	
		min. pressure	max. pressure
3- jet	agrotop	2	8
7- hole	TeeJet	1,5	4
FD	Lechler	1,5	4
Drag hose	**AMAZONE**	1	4

13.2.1 Spray table for three-ray nozzle, spraying height 120 cm

AMAZONE - spray table for three-ray nozzles (yellow)

Pressure	Nozzle output		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.0	0.36	0.32	64	55	48	43	39	35	32	28	24
1.2	0.39	0.35	69	60	52	47	42	38	35	30	26
1.5	0.44	0.39	78	67	59	53	47	43	39	34	30
1.8	0.48	0.42	85	73	64	57	51	47	43	37	32
2.0	0.50	0.44	88	75	66	59	53	48	44	38	33
2.2	0.52	0.46	92	78	69	62	55	50	46	39	35
2.5	0.55	0.49	98	84	74	66	57	54	49	52	37
2.8	0.58	0.52	103	88	77	69	62	56	52	44	39
3.0	0.60	0.53	106	91	80	71	64	58	53	46	40

AMAZONE - spray table for three-ray nozzles (red)

Pressure	Nozzle output		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.0	0.61	0.54	108	93	81	72	65	59	54	47	41
1.2	0.67	0.59	118	101	88	78	70	64	59	51	44
1.5	0.75	0.66	132	114	99	88	79	72	66	57	50
1.8	0.79	0.69	138	119	104	92	83	76	69	60	52
2.0	0.81	0.71	142	122	107	95	85	78	71	61	54
2.2	0.84	0.74	147	126	111	98	88	80	74	63	56
2.5	0.89	0.78	155	133	117	104	93	84	78	67	59
2.8	0.93	0.82	163	140	122	109	98	87	82	70	61
3.0	0.96	0.84	168	144	126	112	101	92	84	72	63

AMAZONE - spray table for three-ray nozzles (blue)

Pres-sure	Nozzle output		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.0	0.86	0.76	152	130	114	101	91	83	76	65	57
1.2	0.94	0.83	166	142	124	110	99	91	83	71	62
1.5	1.05	0.93	186	159	140	124	112	102	93	80	70
1.8	1.11	0.98	196	167	147	131	117	107	98	84	74
2.0	1.15	1.01	202	173	152	135	121	110	101	87	76
2.2	1.20	1.06	212	182	159	141	127	116	106	91	80
2.5	1.26	1.12	224	192	168	149	135	122	112	96	84
2.8	1.32	1.17	234	201	176	156	141	128	117	101	88
3.0	1.36	1.20	240	206	180	160	144	131	120	103	90

AMAZONE - spray table for three-ray nozzles (white)

Pres-sure	Nozzle output		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.0	1.16	1.03	206	177	155	137	124	213	103	89	78
1.2	1.27	1.12	224	192	168	149	134	222	112	96	84
1.5	1.42	1.26	252	217	190	168	151	138	126	109	95
1.8	1.56	1.38	277	237	207	184	166	151	139	119	104
2.0	1.64	1.45	290	249	217	193	174	158	145	125	109
2.2	1.73	1.54	307	263	230	204	185	168	154	132	115
2.5	1.84	1.62	325	279	244	216	195	178	163	140	122
2.8	1.93	1.71	342	293	256	228	205	187	171	147	128
3.0	2.01	1.78	356	305	267	237	214	194	178	153	134

13.2.2 Spray table for 7-hole nozzles

AMAZONE spray table for 7-hole nozzle SJ7-02VP (yellow)

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.5	0.55	0.49	98	84	74	65	59	53	49	42	37
2.0	0.64	0.57	114	98	86	76	68	62	57	49	43
2.5	0.72	0.64	128	110	96	85	77	70	64	55	48
3.0	0.80	0.71	142	122	107	95	85	77	71	61	53
3.5	0.85	0.75	150	129	113	100	90	82	75	64	56
4.0	0.93	0.82	164	141	123	109	98	89	82	70	62

AMAZONE spray table for 7-hole nozzle SJ7-03VP (blue)

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.5	0.87	0.77	154	132	116	103	92	84	77	66	58
2.0	1.00	0.88	176	151	132	117	106	96	88	75	66
2.5	1.10	0.97	194	166	146	129	116	106	97	83	73
3.0	1.18	1.04	208	178	156	139	125	113	104	89	78
3.5	1.27	1.12	224	192	168	149	134	122	112	96	84
4.0	1.31	1.16	232	199	174	155	139	127	116	99	87

AMAZONE spray table for 7-hole nozzle SJ7-04VP (red)

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.5	1.17	1.04	208	178	156	139	125	113	104	89	78
2.0	1.33	1.18	236	202	177	157	142	129	118	101	89
2.5	1.45	1.28	256	219	192	171	154	140	128	110	96
3.0	1.55	1.37	274	235	206	183	164	149	137	117	103
3.5	1.66	1.47	295	253	221	196	177	161	147	126	110
4.0	1.72	1.52	304	261	228	203	182	166	152	130	114

AMAZONE spray table for 7-hole nozzle SJ7-05VP (brown)

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.5	1.49	1.32	264	226	198	176	158	144	132	113	99
2.0	1.68	1.49	298	255	224	199	179	163	149	128	112
2.5	1.83	1.62	324	278	243	216	194	177	162	139	122
3.0	1.95	1.73	346	297	260	231	208	189	173	148	130
3.5	2.11	1.87	374	321	281	249	224	204	187	160	140
4.0	2.16	1.91	382	327	287	255	229	208	191	164	143

AMAZONE spray table for 7-hole nozzle SJ7-06VP (grey)

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.5	1.77	1.57	314	269	236	209	188	171	157	135	118
2.0	2.01	1.78	356	305	267	237	214	194	178	153	134
2.5	2.19	1.94	388	333	291	259	233	212	194	166	146
3.0	2.35	2.08	416	357	312	277	250	227	208	178	156
4.0	2.61	2.31	562	396	347	308	277	252	231	198	173

AMAZONE spray table for 7-hole nozzle SJ7-08VP (white)

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.5	2.28	2.02	404	346	303	269	242	220	202	173	152
2.0	2.66	2.35	470	403	353	313	282	256	235	201	176
2.5	2.94	2.60	520	446	390	347	312	284	260	223	195
3.0	3.15	2.79	558	478	419	372	335	304	279	239	209
4.0	3.46	3.06	612	525	459	408	367	334	306	262	230

13.2.3 Spray table for FD nozzles

AMAZONE spray table for FD-04 nozzle

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1,5	1,13	1,00	200	171	150	133	120	109	100	86	75
2,0	1,31	1,15	230	197	173	153	138	125	115	99	86
2,5	1,46	1,29	258	221	194	172	155	141	129	111	97
3,0	1,60	1,41	282	241	211	188	169	154	141	121	106
4,0	1,85	1,63	326	279	245	217	196	178	163	140	122

AMAZONE spray table for FD-05 nozzle

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1,5	1,41	1,24	248	213	186	165	149	135	124	106	93
2,0	1,63	1,44	288	247	216	192	173	157	144	123	108
2,5	1,83	1,61	322	276	242	215	193	176	161	138	121
3,0	2,00	1,76	352	302	264	235	211	192	176	151	132
4,0	2,31	2,03	406	348	305	271	244	221	203	174	152

AMAZONE spray table for FD-06 nozzle

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.5	1.70	1.49	298	255	224	199	179	163	149	128	112
2.0	1.96	1.72	344	295	258	229	206	188	172	147	129
2.5	2.19	1.93	386	331	290	257	232	211	193	165	145
3.0	2.40	2.11	422	362	317	282	253	230	211	181	158
4.0	2.77	2.44	488	418	366	325	293	266	244	209	183

AMAZONE spray table for FD-08 nozzle

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.5	2.26	1.99	398	341	299	265	239	217	199	171	149
2.0	2.61	2.30	460	394	345	307	276	251	230	197	173
2.5	2.92	2.57	514	441	386	343	308	280	257	220	193
3.0	3.20	2.82	563	483	422	375	338	307	282	241	211
4.0	3.70	3.25	650	557	488	433	390	355	325	279	244

AMAZONE spray table for FD-10 nozzle

Pressure	Nozzle output per nozzle		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1.5	2.83	2.49	498	427	374	332	299	272	249	214	187
2.0	3.27	2.88	576	494	432	384	345	314	288	246	216
2.5	3.65	3.21	642	551	482	429	385	350	321	275	241
3.0	4.00	3.52	704	604	528	469	422	384	352	302	264
4.0	4.62	4.07	813	697	610	542	488	444	407	348	305

13.3 Spray table for drag hose unit

Pres-sure	Nozzle output per dosing disc		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1,0	0,20	0,18	71	61	53	47	43	37	36	31	27
1,2	0,22	0,19	78	67	58	52	47	43	39	34	29
1,5	0,24	0,21	85	73	64	57	51	47	43	37	32
1,8	0,26	0,23	92	79	69	61	55	50	46	40	35
2,0	0,28	0,25	99	85	74	66	60	54	50	43	37
2,2	0,29	0,26	103	88	77	68	62	56	52	44	39
2,5	0,31	0,27	110	94	82	73	66	60	55	47	41
2,8	0,32	0,28	113	97	85	76	68	62	57	49	43
3,0	0,34	0,30	120	103	90	80	72	66	60	52	45
3,5	0,36	0,32	127	109	96	85	77	70	64	55	48
4,0	0,39	0,35	138	118	104	92	83	76	69	59	52

AMAZONE Spray table with dosing disc 4916-32, (dia. 0.8 mm)

Pres-sure	Nozzle output per dosing disc		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1,0	0,31	0,27	110	94	82	73	66	60	55	47	41
1,2	0,34	0,30	120	103	90	80	72	66	60	52	45
1,5	0,38	0,34	135	115	101	90	81	74	68	58	51
1,8	0,41	0,36	145	124	109	97	87	79	73	62	55
2,0	0,43	0,38	152	130	114	101	92	83	76	65	57
2,2	0,45	0,40	159	137	119	106	96	87	80	69	60
2,5	0,48	0,42	170	146	127	113	102	93	85	73	64
2,8	0,51	0,45	181	155	135	120	109	98	91	78	68
3,0	0,53	0,47	188	161	141	125	113	103	94	81	71
3,5	0,57	0,50	202	173	151	135	121	110	101	87	76
4,0	0,61	0,54	216	185	162	144	130	118	108	93	81

AMAZONE Spray table for dosing disc 4916-39, (dia. 1.0 mm) (standard)

Pres-sure	Nozzle output per dosing disc		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1,0	0,43	0,38	153	131	114	101	92	84	77	66	57
1,2	0,47	0,41	167	143	124	110	100	91	84	72	62
1,5	0,53	0,47	187	160	141	126	112	102	94	80	71
1,8	0,58	0,51	204	175	154	137	122	112	102	88	77
2,0	0,61	0,53	216	185	162	144	130	118	108	93	81
2,2	0,64	0,56	227	194	170	151	136	124	114	97	85
2,5	0,68	0,59	240	206	180	160	142	132	120	103	90
2,8	0,71	0,62	251	215	189	168	151	137	126	108	95
3,0	0,74	0,64	262	224	197	175	158	143	131	112	99
3,5	0,79	0,69	280	236	210	186	168	153	140	118	105
4,0	0,85	0,74	302	259	226	201	181	165	151	130	113

AMAZONE Spray table for dosing disc 4916-45, (dia. 1.2 mm)

Pres-sure	Nozzle output per dosing disc		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1,0	0,57	0,50	202	173	151	135	121	110	101	87	76
1,2	0,62	0,55	219	188	165	146	132	120	110	94	83
1,5	0,70	0,62	248	212	186	165	149	135	124	106	93
1,8	0,77	0,68	273	234	204	182	164	148	137	117	102
2,0	0,81	0,72	287	246	215	192	172	157	144	123	108
2,2	0,86	0,76	304	261	228	203	183	166	152	131	114
2,5	0,92	0,81	326	279	244	217	196	178	163	140	122
2,8	0,96	0,85	340	291	255	227	204	186	170	146	128
3,0	1,00	0,89	354	303	266	236	213	193	177	152	133
3,5	1,10	0,97	389	334	292	260	234	213	195	167	146
4,0	1,16	1,03	411	352	308	274	246	224	206	176	154

AMAZONE Spray table for dosing disc 4916-55, (dia. 1.4 mm)

Pres-sure	Nozzle output per dosing disc		AUS spray rate (l/ha) / km/h								
	Water	AUS	6	7	8	9	10	11	12	14	16
(bar)	(l/min)										
1,0	0,86	0,76	304	261	228	203	183	166	152	131	114
1,2	0,93	0,82	329	282	247	219	198	180	165	141	124
1,5	1,05	0,93	372	319	278	248	223	203	186	160	139
1,8	1,15	1,02	407	349	305	271	245	222	204	175	153
2,0	1,22	1,08	432	370	324	288	259	236	216	185	162
2,2	1,27	1,12	450	385	337	300	270	245	225	163	168
2,5	1,35	1,19	478	410	358	319	287	261	239	205	179
2,8	1,43	1,27	506	434	380	337	304	276	253	217	190
3,0	1,47	1,30	520	446	390	347	312	284	260	223	195
3,5	1,59	1,41	563	482	422	375	338	307	282	241	211
4,0	1,69	1,50	598	513	449	399	359	327	299	257	225

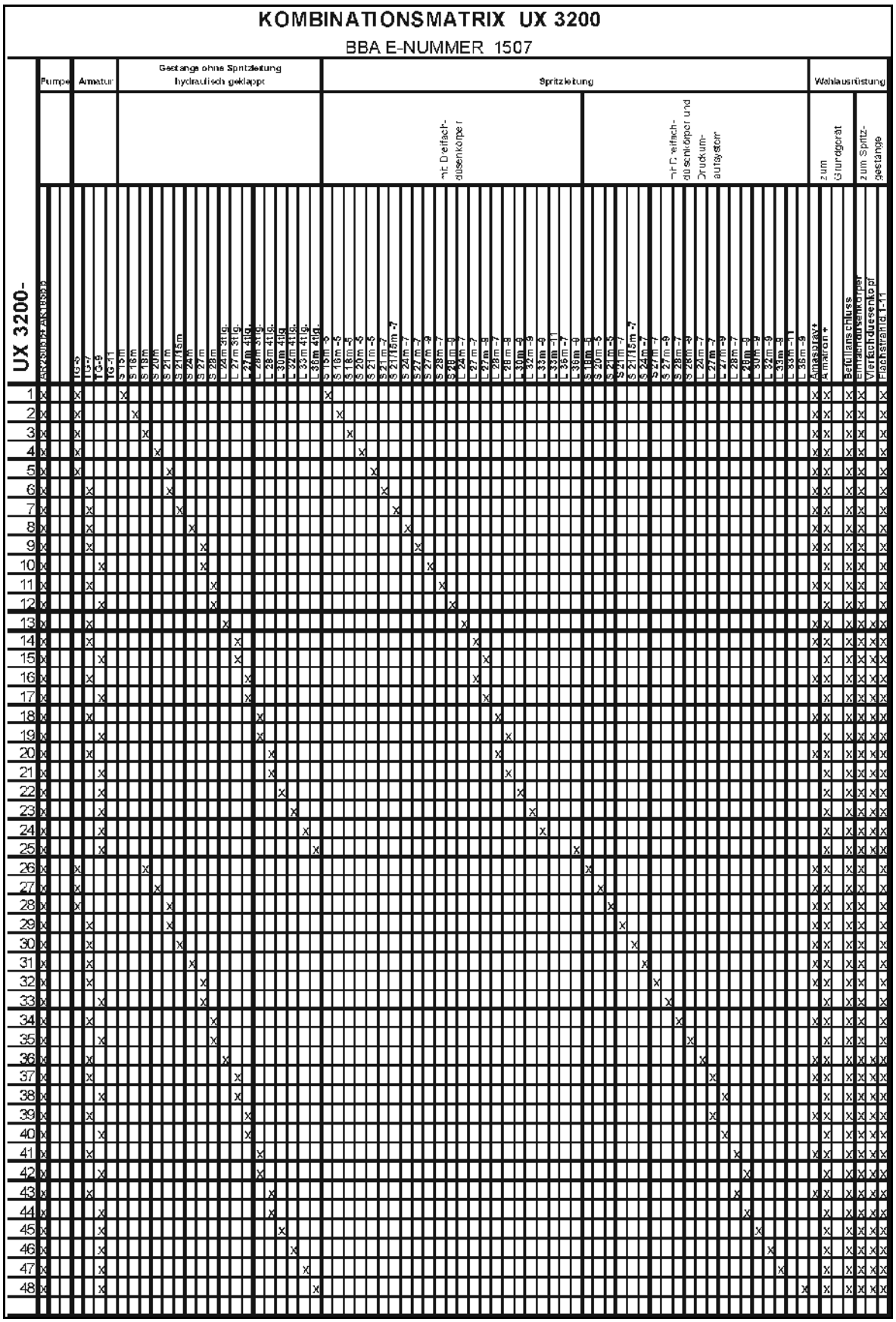
13.4 Conversion table for spraying ammonium nitrate / urea solution (AUS) liquid fertiliser

(Density 1.28 kg/l, i.e. approx. 28 kg N for 100 kg of liquid fertiliser or 36 kg N for 100 litres of liquid fertiliser at 5

N kg	Sol. N l	Sol. N kg	N kg	Sol. N l	Sol. N kg	N kg	Sol. N l	Sol. N kg	N kg	Sol. N l	Sol. N kg
10	27.8	35.8	52	144.6	186.0	94	261.2	335.8	136	378.0	485.0
12	33.3	42.9	54	150.0	193.0	96	266.7	342.7	138	384.0	493.0
14	38.9	50.0	56	155.7	200.0	98	272.0	350.0	140	389.0	500.0
16	44.5	57.1	58	161.1	207.3	100	278.0	357.4	142	394.0	507.0
18	50.0	64.3	60	166.7	214.2	102	283.7	364.2	144	400.0	515.0
20	55.5	71.5	62	172.3	221.7	104	285.5	371.8	146	406.0	521.0
22	61.6	78.5	64	177.9	228.3	106	294.2	378.3	148	411.0	529.0
24	66.7	85.6	66	183.4	235.9	108	300.0	386.0	150	417.0	535.0
26	75.0	92.9	68	188.9	243.0	110	305.6	393.0	155	431.0	554.0
28	77.8	100.0	70	194.5	250.0	112	311.1	400.0	160	445.0	572.0
30	83.4	107.1	72	200.0	257.2	114	316.5	407.5	165	458.0	589.0
32	89.0	114.2	74	204.9	264.2	116	322.1	414.3	170	472.0	607.0
34	94.5	121.4	76	211.6	271.8	118	328.0	421.0	175	486.0	625.0
36	100.0	128.7	78	216.5	278.3	120	333.0	428.0	180	500.0	643.0
38	105.6	135.9	80	222.1	285.8	122	339.0	436.0	185	514.0	660.0
40	111.0	143.0	82	227.9	292.8	124	344.0	443.0	190	527.0	679.0
42	116.8	150.0	84	233.3	300.0	126	350.0	450.0	195	541.0	696.0
44	122.2	157.1	86	238.6	307.5	128	356.0	457.0	200	556.0	714.0
46	127.9	164.3	88	242.2	314.1	130	361.0	465.0			
48	133.3	171.5	90	250.0	321.7	132	367.0	471.0			
50	139.0	178.6	92	255.7	328.3	134	372.0	478.0			

14 Combination matrix

14.1 Combination matrix **UX 3200**



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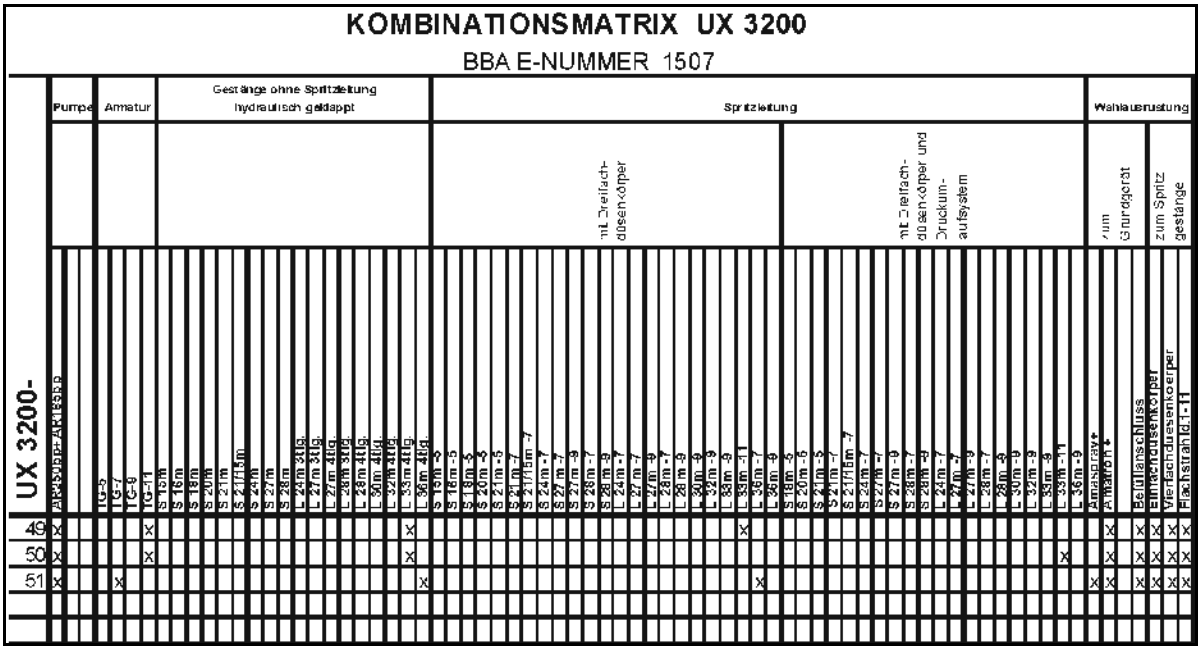
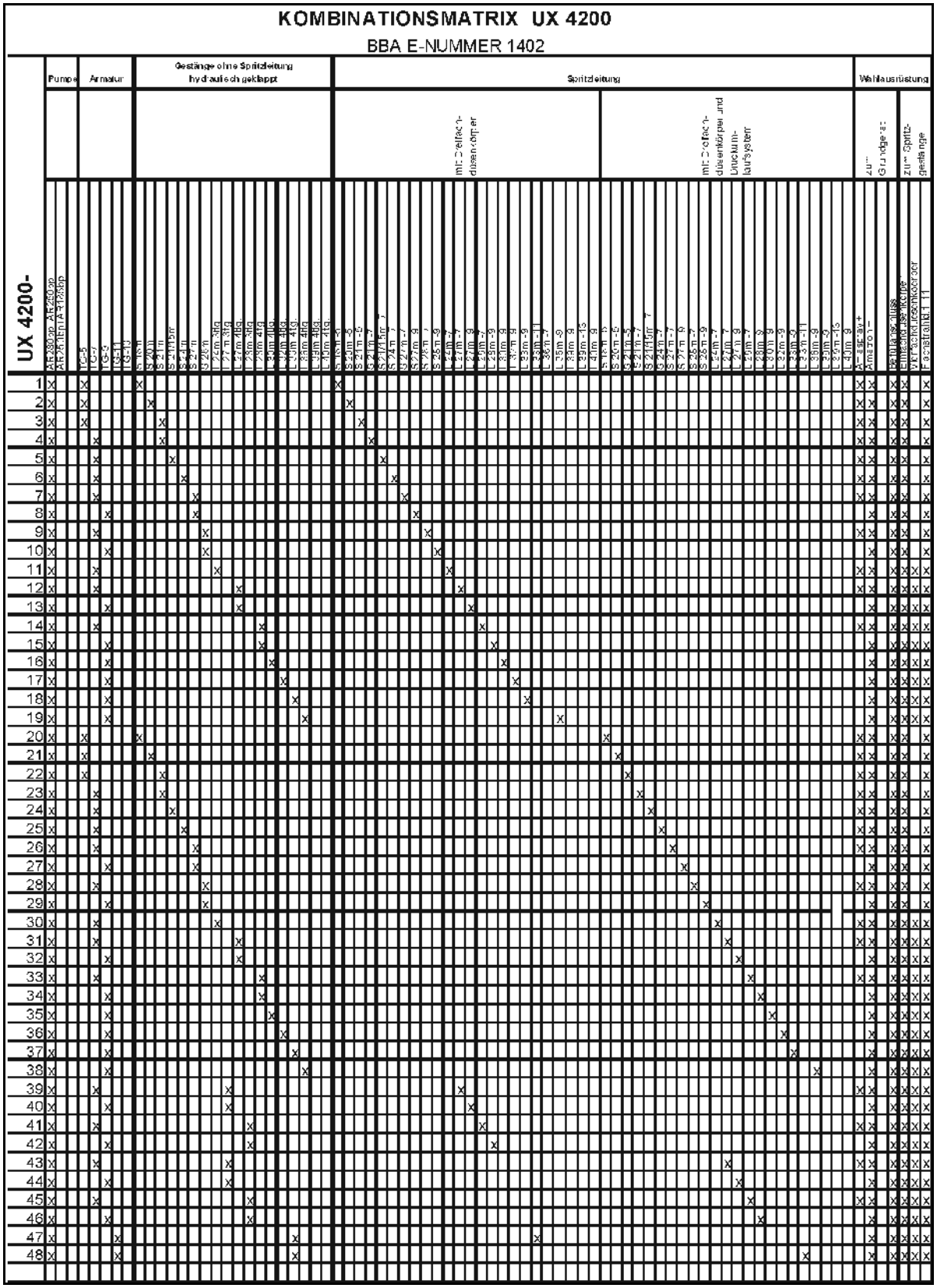
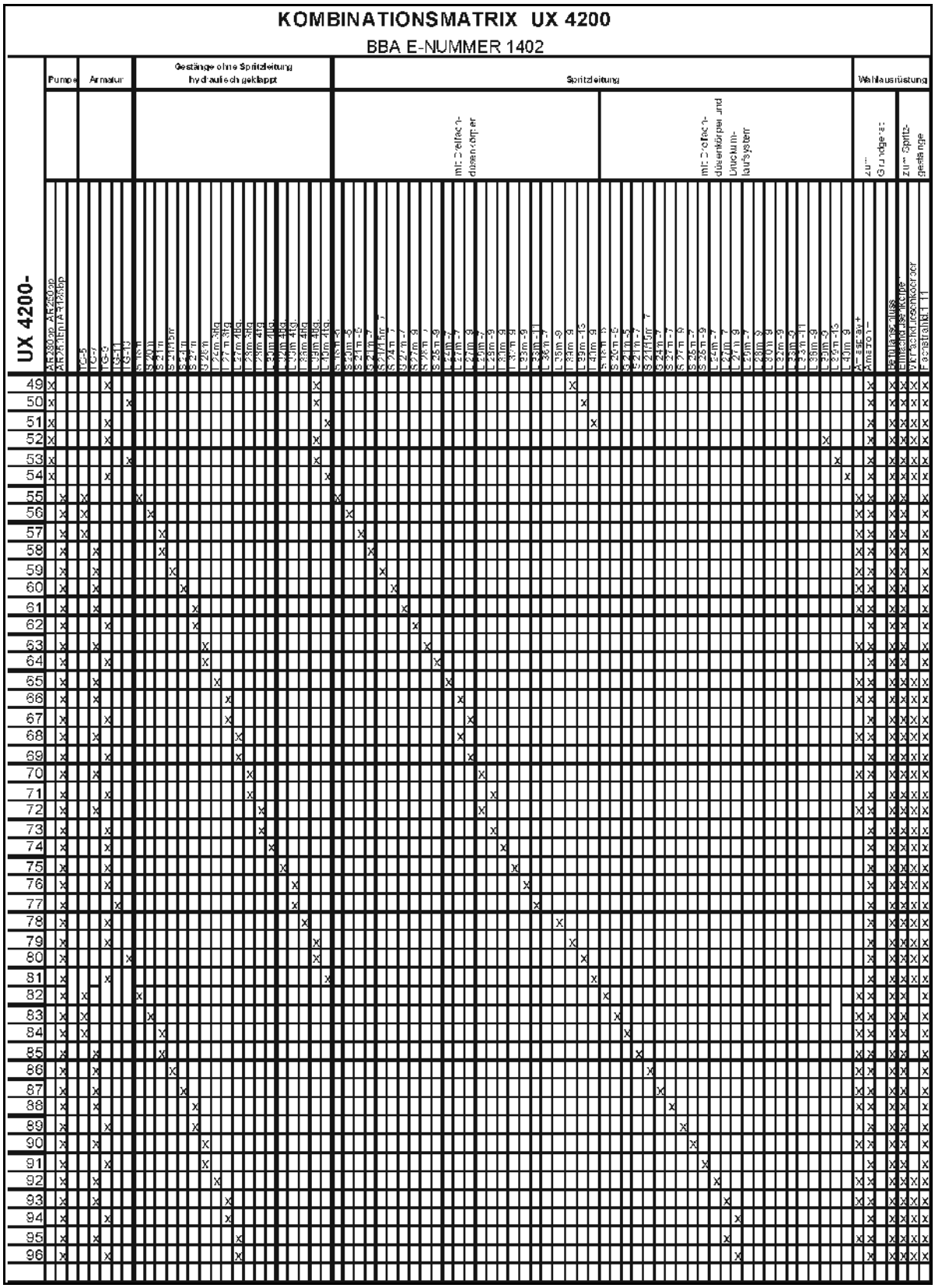

KOMBINATIONSMATRIX UX 3200
BBA E-NUMMER 1507
UX 3200-
Pumpe
Armatur
Gestänge ohne Spritzleitung hydraulisch geklappt
Spritzleitung
Wahlausrüstung
mit Dreifach-düsenkörper
mit Dreifach-düsenkörper und Druckum-schaltsystem
zum Grundgerät
zum Spritz gestänge
AR-Doppel-Membran
TG-5
TG-7
TG-9
TG-11
S 15m
S 16m
S 18m
S 20m
S 21m
S 21/15m
S 24m
S 27m
S 28m
L 24m 3tlg.
L 27m 3tlg.
L 27m 4tlg.
L 28m 3tlg.
L 28m 4tlg.
L 30m 4tlg.
L 32m 4tlg.
L 33m 4tlg.
L 36m 4tlg.
S 15m -5
S 18m -5
S 18m -7
S 20m -5
S 21m -5
S 21/15m -7
S 24m -7
S 24m -7
S 27m -7
S 27m -9
S 28m -7
S 28m -9
L 24m -7
L 27m -7
L 27m -9
L 28m -7
L 28m -9
L 30m -9
L 32m -9
L 33m -9
L 33m -11
L 36m -7
L 36m -9
S 18m -5
S 20m -5
S 21m -5
S 21/15m -7
S 24m -7
S 27m -7
S 28m -7
S 28m -9
L 24m -7
L 27m -7
L 27m -9
L 28m -7
L 28m -9
L 30m -9
L 32m -9
L 33m -9
L 33m -11
L 36m -9
Anasprav+
Anbaren+
Befüllanschluss
Einschraubkörper
Vierfachdüsenkörper
Flachstrahldü.-11
49
50
51

As of 11/2007

14.2 Combination matrix **UX 4200**



As of 11/2007


KOMBINATIONSMATRIX UX 4200
BBA E-NUMMER 1402
UX 4200-
Pumpe
Armatur
Gestänge ohne Spritzleitung hydraulisch geklappt
Spritzleitung
mit Doppeldüsenkörper
mit Doppeldüsenkörper und Leuchtmittelsystem
Wahlausrüstung
zum Grundgerät
zum Spritzgestänge
AR 280 op
AR 340 op
AR 440 op
IG-5
IG-7
IG-9
IG-11
IG-13
S 18 m
S 20 m
S 21 m
S 21/15 m
S 24 m
S 24/15 m
S 27 m
L 27 m 3fg
L 27 m 4fg
L 28 m 3fg
L 28 m 4fg
L 31 m 4fg
L 34 m 4fg
L 37 m 4fg
L 40 m 4fg
L 43 m 4fg
S 18 m -5
S 24 m -5
S 24 m -7
S 24/15 m -7
S 27 m -7
S 27 m -9
S 28 m -7
S 28 m -9
L 27 m -7
L 27 m -9
L 28 m -7
L 28 m -9
L 31 m -9
L 34 m -9
L 34 m -11
L 36 m -9
L 36 m -11
L 37 m -9
L 39 m -13
L 40 m -9
L 43 m -9
S 18 m -5
S 24 m -5
S 21 m -7
S 21/15 m -7
S 24 m -7
S 24 m -9
S 27 m -7
S 27 m -9
S 28 m -7
S 28 m -9
L 27 m -7
L 27 m -9
L 28 m -7
L 28 m -9
L 31 m -9
L 34 m -9
L 34 m -11
L 36 m -9
L 36 m -11
L 37 m -9
L 39 m -13
L 40 m -9
L 43 m -9
AmaTron+
AmaTron
Handhebelbedienung
Elektrohydraulische Bedienung
Vorgewendeschalter
Fächerstahl 1.11

As of 11/2007

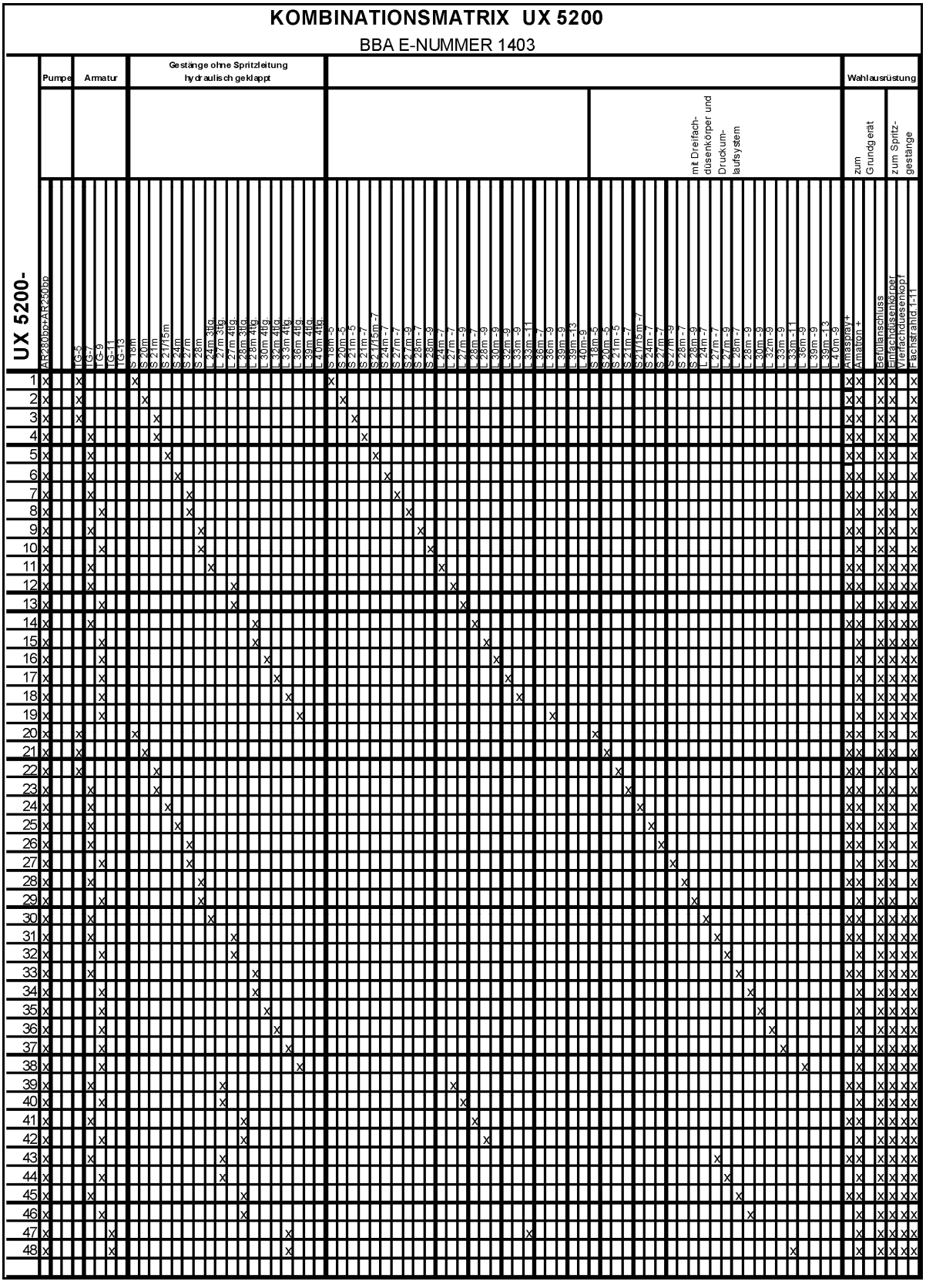
KOMBINATIONSMATRIX UX 4200

BBA E-NUMMER 1402

UX 4200-	Pumpe	Armatur	Gestänge ohne Spritzleitung hydraulisch geklappt	Spritzleitung		Wahlausrüstung	
				mit Dreifach-düsenkörper	mit Dreifach-düsenkörper und Druckum-laufsystem	zum Grundgerät	zum Spritz-gestänge
	AR2300p+AR2500p AR2500p+AR1885p	TG-5 TG-7 TG-9 TG-11 TG-13	S 18m S 20m S 21m S 21/15m S 24m S 27m S 28m L 24m 3stg L 27m 3stg L 27m 4stg L 28m 4stg L 28m 5stg L 30m 4stg L 32m 4stg L 33m 4stg L 36m 4stg L 39m 4stg L 40m 4stg	S 18m -5 S 20m -5 S 21m -5 S 21m -7 S 21/15m -7 S 24m -7 S 27m -7 S 27m -9 S 28m -7 S 28m -9 L 24m -7 L 27m -7 L 27m -9 L 28m -7 L 28m -9 L 30m -9 L 32m -9 L 33m -9 L 33m -11 L 36m -7 L 36m -9 L 39m -9 L 39m -13 L 40m -9 S 18m -5 S 20m -5 S 21m -5 S 21m -7 S 21/15m -7 S 24m -7 S 27m -7 S 27m -9 S 28m -7 S 28m -9 L 24m -7 L 27m -7 L 27m -9 L 28m -7 L 28m -9 L 30m -9 L 32m -9 L 33m -9 L 33m -11 L 36m -9 L 39m -9 L 39m -13 L 40m -9	Amasray+ Amatron+	Befüllanschluss Einfachdüsenkörper Vierfachdüsenkörper Flachstrahl 1-11
97	x	x	x			x x	x x x x
98	x	x	x			x	x x x x
99	x	x	x			x x	x x x x
100	x	x	x			x	x x x x
101	x	x	x			x x	x x x x
102	x	x	x			x	x x x x
103	x	x	x			x x	x x x x
104	x	x	x			x	x x x x
105	x	x	x			x x	x x x x
106	x	x	x			x	x x x x
107	x	x	x			x x	x x x x
108	x	x	x			x	x x x x
109	x	x	x		x	x x	x x x x

As of 11/2007

14.3 Combination matrix **UX 5200**



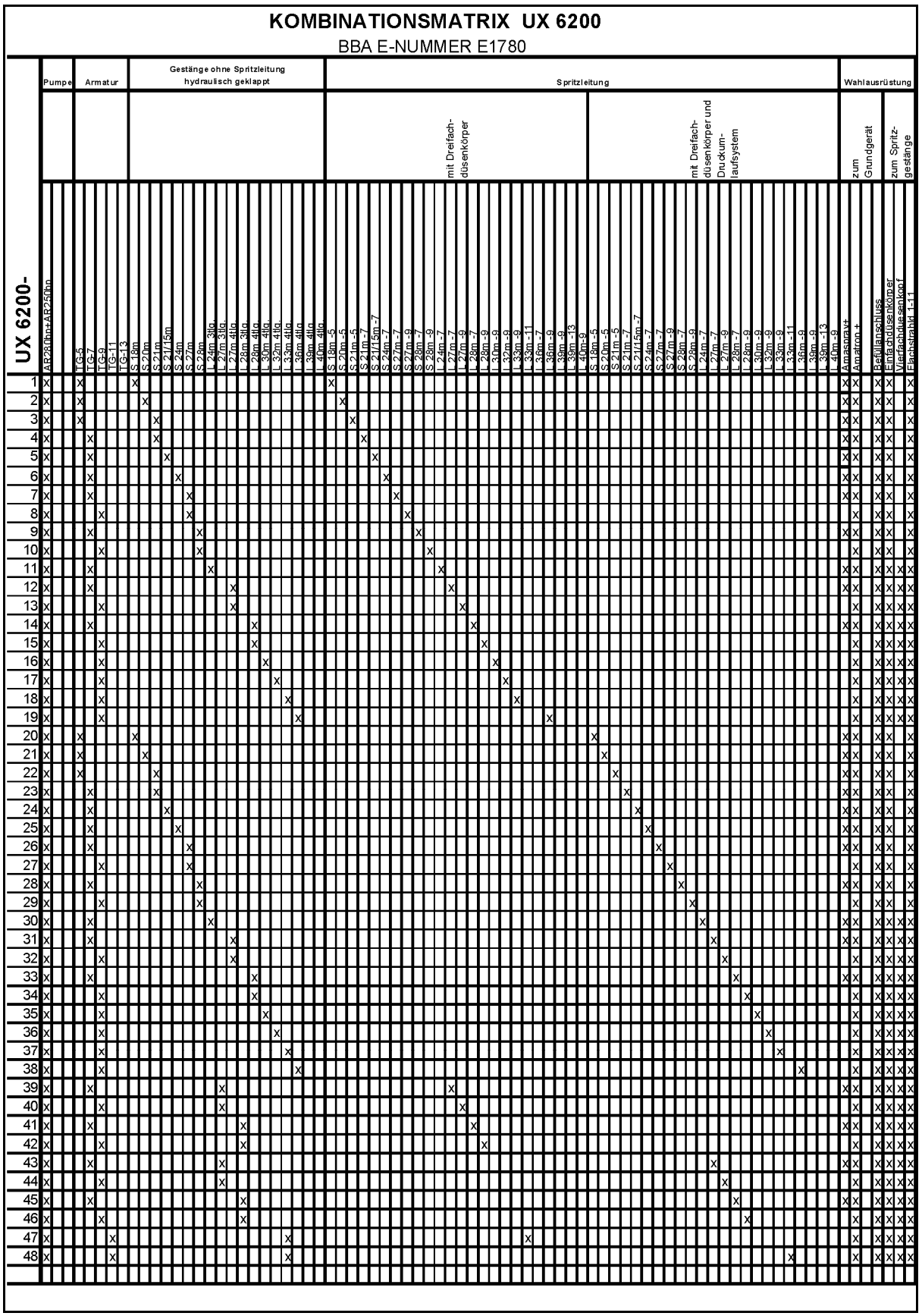
As of 11/2007

KOMBINATIONSMATRIX UX 5200

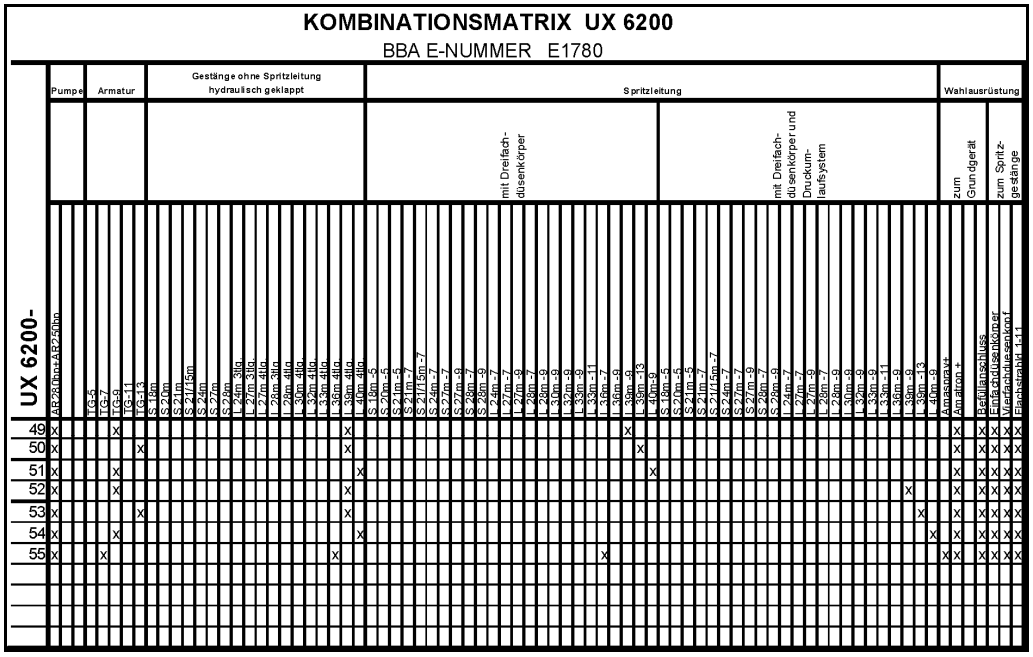
BBA E-NUMMER 1403

| UX 5200- | Pumpe | Armatur | | | | Gestänge ohne Spritzleitung hydraulisch geklappt | | | |

14.4 Combination matrix **UX 6200**



As of 11/2009



As of 11/2009

14.5 Nozzle description

1) Flat-fan nozzle XRC		2) Flat-fan nozzle AD		3) Flat-fan nozzle AIR MIX		4) Flat-fan nozzle IDK	
plastic / exterior plastic, core ceramic (Lechler)		plastic (Lechler)		plastic (Agrotop)		plastic (Lechler)	
-015	-04	-015		-015	-05	-015	-04
-02	-05	-02		-02	-06	-02	-05
-025	-06	-03		-03		-025	
-03	-08	-04		-04		-03	
5) Flat-fan nozzle IDKN		**6) Flat-fan nozzle ID**		**7) Flat-fan nozzle IDN**		**8) Flat-fan nozzle TTI**	
plastic (Lechler)		plastic / exterior plastic - Kern Keramik (Lechler)		plastic (Lechler)		plastic (Teejet)	
-03		-015	-04	-025		-015	-04
-04		-02	-05	-03		-02	-05
		-025	-06			-025	-06
		-03				-03	
9) Double flat-fan nozzles IDKT		**10) Double flat-fan nozzles AVI-TWIN**		**11) Double flat-fan nozzles TD Hi Speed**			
exterior plastic, core ceramic (Lechler)		exterior plastic, core ceramic (Agrotop)		exterior plastic, core ceramic (Agrotop)			
-03		-015	-04	-015	-04		
-04		-02	-05	-02	-05		
-05		-025		-025			
		-03		-03			

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